973/4

Vol. 973 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 22, 1978

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 22, 1978 Volume 973 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

United States Patent and Trademark Office Before the Commissioner of Patents and Trademarks

IN RE STEPHEN WYDEN, RESPONDENT.

PROCEEDINGS FOR SUSPENSION OR DISBARMENT

Final Order

Upon consideration of a Joint Motion for Entry of Final Order filed by the Solicitor and respondent, it is hereby

ORDERED that Stephen Wyden of Brooklyn, N.Y., whose registration number is 26,060, is suspended, beginning on August 30, 1978, from practicing as a patent agent before the United States Patent and Trademark Office for a period of two (2) years; and it is

FURTHER ORDERED that Stephen Wyden may be reinstated as a patent agent upon showing satisfactory to the Committee on Enrollment that respondent is competent in all respects to practice patent law before the United States Patent and Trademark Office.

Entry of this order terminates these proceedings.

This order is being entered pursuant to 35 U.S.C. 32 and 37 CFR 1.348.

DONALD W. BANNER,
Dated: July 27, 1978. *Commissioner.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 208,148, Re. S.N. 905,387, Filed May 12, 1978, Cl. D10/8, PULL, John R. Morgan, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, Ex. Gp.: 290

D. 209,813, Re. S.N. 905,388, Filed May 12, 1978, Cl. 10/8, PULL, Laverne E. Clayton, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, Ex. Gp.: 290

3,624,632, Re. S.N. 913,143, Filed Jun. 6, 1978, Cl. 340/324 A, MIXED ALPHAMERIC-GRAPHIC DISPLAY, David Ophir, Owner of Record: *Applied Digital Data Systems, Inc., Hauppauge, N.Y.,* Attorney or Agent: Joseph A. DeGrandi, Ex. Gp.: 234

3,630,781, Re. S.N. 913,890, Filed Jun. 8, 1978, Cl. 429/126, PROCESS OF FORMING RECHARGEABLE ELECTRODES UTILIZING UNSINTERED FLUOROCARBON BINDER, Guy Rampel, Owner of Record: *General Electric Company, Columbus, Ohio,* Attorney or Agent: Edward A. Hedman, et al., Ex. Gp.: 114

3,705,608, Re. S.N. 919,405, Filed Jun. 26, 1978, Cl. 139/127 D, METHOD FOR TRANSPORTING A WEFT THREAD THROUGH A WEAVING SHED AND A LOOM FOR PERFORMING SAID METHOD, Geert Jan Vermeulen, Owner of Record: *Inventor,* Attorney or Agent: Charles O. Marshall, Jr., Ex. Gp.: 353

3,724,285, Re. S.N. 918,329, Filed Jun. 22, 1978, Cl. 74/243 FC, CONVEYOR DRIVE, James M. Lapeyre, Owner of Record: *Inventor,* Attorney or Agent: Robert J. Schiller, et al., Ex. Gp.: 345

3,795,557, Re. S.N. 914,540, Filed Jun. 12, 1978, Cl. 156/646, PROCESS AND MATERIAL FOR MANUFACTURING SEMICONDUCTOR DEVICES, Adir Jacob, Owner of Record: *LFE Corporation, Waltham, Mass.,* Attorney or Agent: Melvin R. Jenney, Ex. Gp.: 161

3,867,216, Re. S.N. 914,539, Filed Jun. 12, 1978, Cl. 156/643, PROCESS AND MATERIAL FOR MANUFACTURING SEMICONDUCTOR DEVICES, Adir Jacob, Owner of Record: *LFE Corporation, Waltham, Mass.,* Attorney or Agent: Melvin R. Jenney, Ex. Gp.: 161

3,875,163, Re. S.N. 907,817, Filed May 19, 1978, Cl. 260/268 BC, NITROGEN CONTAINING ACYCLIC ISOPRENOID COMPOUNDS, Silvia Tricerri Zumin, et al., Owner of Record: *Pierrel S.P.A., Milan, Italy,* Attorney or Agent: Leo A. Rossetta, et al., Ex. Gp.: 122

3,923,986, Re. S.N. 907,816, Filed May 19, 1978, Cl. 424/250, NITROGEN CONTAINING ACYCLIC ISOPRENOID COMPOUNDS IN PHARMACEUTICAL COMPOSITIONS, Silvia Tricerri Zumin, et al., Owner of Record: *Pierrel S.P.A., Milan, Italy,* Attorney or Agent: Leo A. Rossetta, et al., Ex. Gp.: 125

3,933,501, Re. S.N. 916,172, Filed Jun. 16, 1978, Cl. 96/74, PHOTOGRAPHIC ELEMENTS CONTAINING COLOR-FORMING COUPLERS HAVING AND INHIBITING EFFECT UPON THE REACTIVITY OF COMPETING COUPLERS, Robert G. Cameron, et al., Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: J. G. Levitt, et al., Ex. Gp.: 166

3,957,723, Re. S.N. 919,382, Filed Jun. 26, 1978, Cl. 260/45.75 W, FLAME AND SMOKE RETARDANTS FOR POLYVINYL CHLORIDE, David Francis Lawson, et al., Owner of Record: *The Firestone Tire and Rubber Company, Akron, Ohio,* Attorney or Agent: S. M. Clark, et al., Ex. Gp.: 141

3,964,185, Re. S.N. 918,330, Filed Jun. 22, 1978, Cl. 38/14, SEAMBUSTING APPARATUS AND METHOD, Norman J. Bullock, et al., Owner of Record: *W. M. Cissel Manufacturing Company, Louisville, Ky.,* Attorney or Agent: Herbert C. Brinkman, et al., Ex. Gp.: 353

3,966,267, Re. S.N. 918,670, Filed Jun. 23, 1978, Cl. 303/21 BE, SKID CONTROL SYSTEM, Joseph H. McNinch, Jr., et al., Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Raywood H. Blanchard, et al., Ex. Gp.: 315

3,983,919, Re. S.N. 916,699, Filed Jun. 19, 1978, Cl. 152/357 R, HIGH-MODULUS RUBBER COMPOSITION FOR PNEUMATIC TIRES, James W. Messerly, Owner of Record: *The B. F. Goodrich Company, Akron, Ohio,* Attorney or Agent: Michael J. Colitz, Jr., et al., Ex. Gp.: 314

4,002,053, Re. S.N. 899,005, Filed Jul. 13, 1978, Cl. 73/32 R, METHOD AND APPARATUS FOR MEASURING DENSITY SUSPENSION, Noboru Hayakawa, Owner of Record: *Nishihara Environmental Sanitation Research Corp. Ltd., Tokyo, Japan,* Attorney or Agent: Ralph E. Bucknam, et al., Ex. Gp.: 244

4,011,897, Re. S.N. 918,620, Filed Jun. 23, 1978, Cl. 141/207, INTERLOCK SYSTEM FOR A GASOLINE DISPENSING NOZZLE, William B. Hansel, Owner of Record: *Suntech, Inc., St. David, Pa.,* Attorney or Agent: J. Edward Hess, Ex. Gp.: 243

4,032,278, Re. S.N. 918,447, Filed Jun. 23, 1978, Cl. 425/525, SEALING AND SHEARING MEMBER IN A PLASTIC RESIN BLOW MOLDING MACHINE, Ernest O. Kuenzig, et al., Owner of Record: *Forest Mechanical Products Corp., Kew Gardens, N.Y.,* Attorney or Agent: Eliot S. Gerber, Ex. Gp.: 322

4,036,205, Re. S.N. 912,930, Filed Jun. 5, 1978, Cl. 126/126, FIREPLACE STOVE, Robert William Hayes, Owner of Record: *Hayes-Te Equipment Corporation, Unionville, Conn.,* Attorney or Agent: Anthony P. Delio, et al., Ex. Gp.: 344

4,047,444, Re. S.N. 911,019, Filed May 30, 1978, Cl. 74/229, SYNCHRONOUS BELT AND PULLEY DRIVE, Joseph O. Jeffrey, Owner of Record: *Borg-Warner Corporation, Chicago, Ill.,* Attorney or Agent: William S. McCurry, et al., Ex. Gp.: 345

4,083,592, Re. S.N. 918,669, Filed Jun. 23, 1978, Cl. 293/71 R, PROTECTIVE STRIP ASSEMBLY, Richard J. Rubin, et al., Owner of Record: *Boston Metal Products Sales Corporation, Cambridge, Mass.,* Attorney or Agent: Charles C. Winchester, Ex. Gp.: 315

PATENT NOTICES

Certificates of Correction for the Week of Aug. 22, 1978

3,500,373	4,059,630	4,075,652	4,080,949
3,934,124	4,060,831	4,075,732	4,080,966
3,947,941	4,061,067	4,076,543	4,081,256
3,978,977	4,061,211	4,076,992	4,081,353
3,990,009	4,061,247	4,077,067	4,081,384
3,993,977	4,061,755	4,077,150	4,081,461
3,996,244	4,061,893	4,077,169	4,081,551
3,997,879	4,062,091	4,077,362	4,081,595
4,008,388	4,062,231	4,077,416	4,081,624
4,016,036	4,062,663	4,077,437	4,081,862
4,016,479	4,062,743	4,077,567	4,081,910
4,017,345	4,062,859	4,077,615	4,082,130
4,025,926	4,063,375	4,077,753	4,082,226
4,026,906	4,064,274	4,077,795	4,082,431
4,027,121	4,064,746	4,077,856	4,082,576
4,027,246	4,064,747	4,078,046	4,082,652
4,029,632	4,066,999	4,078,183	4,082,748
4,033,520	4,067,061	4,078,185	4,082,824
4,035,603	4,067,301	4,078,249	4,082,892
4,036,221	4,067,651	4,078,481	4,082,901
4,036,598	4,067,836	4,078,483	4,083,173
4,036,885	4,067,920	4,078,582	4,083,189
4,036,956	4,068,252	4,078,747	4,083,220
4,040,634	4,069,017	4,078,820	4,083,221
4,041,227	4,069,151	4,078,874	4,083,353
4,041,292	4,069,256	4,078,957	4,083,885
4,041,983	4,070,638	4,078,969	4,083,940
4,043,646	4,070,857	4,079,087	4,084,225
4,044,379	4,071,902	4,079,141	4,084,911
4,045,671	4,072,428	4,079,159	4,084,992
4,046,405	4,072,576	4,079,416	4,085,020
4,046,775	4,072,963	4,079,444	4,085,036
4,049,128	4,073,229	4,079,448	4,085,147
4,049,203	4,073,320	4,079,707	4,085,155
4,049,280	4,073,481	4,079,821	4,085,682
4,049,516	4,073,654	4,079,990	4,085,766
4,053,635	4,073,882	4,080,161	4,086,137
4,054,663	4,074,032	4,080,187	4,086,145
4,055,589	4,074,117	4,080,218	4,086,678
4,057,258	4,074,371	4,080,267	4,087,607
4,057,839	4,074,392	4,080,358	4,088,931
4,058,646	4,074,562	4,080,556	
4,059,525	4,074,985	4,080,730	

Dedications

3,686,899.—*Howard Rosenfeld,* New York, N.Y., and *Justin J. Wetzler,* Evanston, Ill. LAUNDERING SYSTEM. Patent dated Aug. 29, 1972. Dedication filed July 21, 1978, by the assignees, *Ludell Mfg. Co., Inc.* and *American Linen Supply Co.*

Hereby dedicate to the Public the remaining term of said patent.

3,780,543.—*Howard Rosenfeld,* New York, N.Y., and *Justin J. Wetzler,* Evanston, Ill. LAUNDERING SYSTEM WITH SOAK OF GARMENTS ON HANGERS. Patent dated Dec. 25,1973. Dedication filed July 21, 1978, by the assignees, *Ludell Mfg., Co., Inc.* and *American Linen Supply Co.*

Hereby dedicate to the Public the remaining term of said patent.

Disclaimers

Reissue No. 29,483.—*Frank Manuel Ré,* Holyoke, Mass. RECLINING CHAIR. Patent dated Nov. 29, 1977. Disclaimer filed July 19, 1978, by the assignee, *Dual Manufacturing and Engineering, Incorporated.*

The term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

3,169,295.—*Stanley F. Paspy,* Zanesville, Ohio. PRECISION TILE SETTER. Patent dated Feb. 16, 1965. Disclaimer filed June 15, 1978, by the assignee, *Ferro Corporation.*

Hereby enters this disclaimer to claims 1, 4, 6, 7 and 8 of said patent.

3,907,415.—*Yoshiaki Sone,* Tokyo, and *Fumio Ueno,* Kawasaki, Japan. FILM SEARCHING APPARATUS. Patent dated Sept. 23, 1975. Disclaimer filed May 30, 1978, by the assignee, *Canon Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1, 2, 4, 5, 6, and 7 of said patent.

3,941,417.—*Frank M. Ré,* Holyoke, Mass. RECLINING CHAIR. Patent dated Mar. 2, 1976. Disclaimer filed July 19, 1978, by the assignee, *Dual Manufacturing and Engineering, Incorporated.*

The term of this patent subsequent to Sept. 11, 1990, has been disclaimed.

4,023,185.—*Allen Bloom,* East Windsor, *Robert Alfred Bartolini,* Trenton, and *Alan Edward Bell,* East Windsor, N.J. ABLATIVE OPTICAL RECORDING MEDIUM. Patent dated May 10, 1977. Disclaimer filed June 22, 1978, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 7, 10, 11 and 13 of said patent.

4,026,494.—*Akira Tanaka,* Northridge, Calif. SAFETY BELT TENSION REDUCING MEANS. Patent dated May 31, 1977. Disclaimer filed June 21, 1978, by the assignee, *American Safety Equipment Corporation.*

The term of this patent subsequent to May 31, 1994, has been disclaimed.

4,045,271.—*Robert Alfred Clarke,* White Plains, *Peter J. Kuhl,* Jackson Heights, and *Richard H. Paschke,* Medford, N.Y. ULTRASONIC METHOD AND APPARATUS FOR MANUFACTURING BRASSIERE TAPES. Patent dated Aug. 30, 1977. Disclaimer filed June 28, 1978, by the assignee, *Cavitron Corporation.*

Hereby enters this disclaimer to claims 1 to 4 and 10 of said patent.

4,064,654.—*Harold G. Olson,* Westport, Conn. SEALED CLOSURES WITH WEATHER STRIPPING. Patent dated Dec. 27, 1977. Disclaimer filed June 21, 1978, by the assignee, *H. G. Olson & Co., Inc.*

The term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

4,081,153.—*Akira Tanaka,* Northridge, and *Charles Ulrich,* Montecito, Calif. SAFETY BELT TENSIONING AND REWINDING RETRACTOR. Patent dated Mar. 28, 1978. Disclaimer filed May 30, 1978, by the assignee, *American Safety Equipment Corporation.*

The term of this patent subsequent to May 31, 1994, has been disclaimed.

Patents Available for Licensing or Sale

3,355,139. SOLENOID CONTROLLED VALVE MECHANISM. Stephen Kittredge, 78 Smith St., South Portland, Maine 04106.

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 DeGrand Ave., Teaneck, N.J. 07666.

3,701,395. RESCUE AND SAFETY VEST. Stuart J. Theobald, 3206 Paul Drive, Wheaton, Md. 20902.

3,770,297. TRAVEL HOME WITH CAR TOP HITCH. Robert G. Quick, Hy-Rider Associates, 7419 Allstate Drive, Petersburg, Va. 23803.

3,880,623. DUST AND MIST COLLECTOR. Mitsugu, Aoyama, Japan. Correspondence to: Frank J. Jordan, 875 Avenue of the Americas, New York, N.Y. 10001.

3,991,922. ABRASIVE SHEET MEASURING AND CUTTING BOARD. Mervin B. Martin, Box 408, R.D. #4, Coatesville, Pa. 19320.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B. Marsh, 1400 North Lake Shore Drive, 14–M, Chicago, Ill. 60610.

4,056,897. PLANTER DESIGN AND CONSTRUCTION. Mary Ellen and John Scott Pearce. Correspondence to: E. Barron Batchelder, Sixbey, Friedman & Leedom, P. C., Suite 206, 2001 Jefferson Davis Hyw., Arlington, Va. 22202.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif. 91793.

4,074,538. WALL STRUCTURES. Jurgen Peter Janus. Neuer Markt 17, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif. 90501.

4,080,923. ANCHOR WITH PIVOTAL SECONDARY FLUKES. Margrete Stinnes, Jackson Heights, N.Y. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,084,341. DETACHABLE GUN LOCK. Ramon H. Cervantes, 4600 78th St., Sacramento, Calif. 95820.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

The General Electric Company is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to the Patent Counsel, Turbine Patent Operation, General Electric Company, 1 River Road, Building 18a, 5th Floor, Schenectady, N.Y. 12345.

3,999,766. DYNAMOELECTRIC MACHINE SHAFT SEAL.

4,055,967. AXIAL MOVEMENT LIMITING COUPLING ASSEMBLY.

4,058,804. SIGNAL MONITORING SYSTEM.

4,082,948. GENERATOR MONITORING APPARATUS.

Application for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19102.

3,947,726. REVERSE VOLTAGE SURGE PROTECTION FOR HIGH-VOLTAGE THYRISTORS.

4,021,764. SHEET-WOUND TRANSFORMER COILS WITH REDUCED EDGE HEATING.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents & Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Techincal Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Request for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP 1900 Half St., SW.,
Washington, D.C. 20324

Patent application 865,268. Interconnection for Planar Electronic Circuits. Filed Dec. 28, 1977.

Patent application 876,444. Low Gamma Photographic Developer. Filed Feb. 9, 1978.

Patent application 876,445. Self-Sealing Fuel Line Assembly. Filed Feb. 9, 1978.

Patent application 878,142. Recoil Motion Distributor for Flexible Ammunition Chuting. Filed Feb. 15, 1978.

Patent application 882,524. Apparatus for Centering a Tubular Fluid Flow Conduit Within a Large Tubular Conduit. Filed Mar. 1, 1978.

Patent 4,076,454. Vortex Generators in Axial Flow Compressor. Filed June 25, 1976. Patented Feb. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements & Patent Branch General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782.

Patent application 878,040. Process for Imparting Water Repellancy to Fibrous Cellulosic Textile Materials. Filed Feb. 15, 1978.

Patent application 878,041. Sized Paper and Method for Producing Same. Filed Feb. 15, 1978.

Patent application 891,953. Extraction of Rubber or Rubber-like Substances from Fibrous Plant Materials. Filed Mar. 31, 1978.

Patent application 891,956. Physiochemically Designed Fat Compositions from Tallow and Process for Making. Filed Mar. 31, 1978.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent application 880,831. Method and Composition for Removing Calcium Sulfate Scale Deposits from Surfaces. Filed Feb. 24, 1978.

Patent 4,071,473. Preparation and Use of High Surface Area Transition Metal Catalysts. Filed Nov. 3, 1976. Patented Jan. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 678,094. Fire Control Correction System for Wind and Target Motion. Filed Apr. 19, 1976.

Patent application 836,324. Apparatus for Launching Stores from a Submerged Vehicle. Filed Sept. 26, 1977.

Patent application 871,861. Alinement Aid. Filed Jan. 24, 1978.

Patent application 874,453. Propagation Sampled Acoustic Line Array. Filed Feb. 2, 1978.

Patent application 875,056. Low Frequency Hydrophone. Filed Feb. 6, 1978.

Patent application 879,555. Liquid Propellant Gun, Positive Displacement Single Valve. Filed Feb. 21, 1978.

Patent application 880,406. Piezoelectric Polymer Membrane Stress Gage. Filed Feb. 23, 1978.

Patent application 885,706. Bi-Metallic Thermal Compensator. Filed Mar. 31, 1978.

Patent application 891,652. Rigid Mount for an Internally Pressurized Tube. Filed Mar. 30 1978.

Patent 4,021,813. Geometrically Derived Beam Circular Antenna Array. Filed Mar. 5, 1976. Patented May 3, 1977. Not available NTIS.

Patent 4,022,705. Gas Generating Compositions. Filed Mar. 27, 1975. Patented May 10, 1977. Not available NTIS.

Patent 4,024,818. Stab-Initiated Explosive Device Containing a Single Explosive Charge. Filed May 16, 1976. Patented May 24, 1977. Not available NTIS.

Patent 4,025,370. Double Base Propellant Containing Azobisformamide. Filed Apr. 4, 1974. Patented May 24, 1977. Not available NTIS.

Patent 4,030,427. Armor Plate. Filed Oct. 30, 1974. Patented June 21, 1977. Not available NTIS.

FORM 1

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 15, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-6-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-18-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-13-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-14-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-23-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-9-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-2-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-19-77

Expiration of patents: The patents within the range of numbers indicated below expire during July 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,990,549 to 2,994,086, inclusive
Plant Patents..... Numbers 2,067 to 2,075, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,736

HIGH SPEED BONE DRILL

John J. Shea, and Harry Phillips, both of Memphis, Tenn., assignors to Xomed Inc., Jacksonville, Fla.

Original No. 4,007,528, dated Feb. 15, 1977, Ser. No. 624,661, Oct. 22, 1975. Application for reissue Apr. 27, 1977, Ser. No. 791,587

Int. Cl.[2] **A61L** *1/08*

U.S. Cl. 32—26 **5 Claims**

1. A high speed drill comprising

[a burr having an elongate slank,]

a hollow casing,

a drive motor in said casing,

a drive member rotatably supported in said casing and drivingly connected at one end to said motor, said drive memver having an elongate hollow tubular portion at the other end thereof [for receiving said burr shank which slidably fits therein] *for slidably receiving a tool having an elongate shank,* means at the inner end of said hollow tubular portion for drivingly connecting [said burr] *the* shank thereto,

a sleeve surrounding the drive member and slidable lengthwise thereon between first and second positions,

detent means engaging between said sleeve and [said burr] *the* shank, said detent means being movable between one position in which the [burr] shank is held against endwise movement relative to said sleeve and another position in which the [burr] shank is released for endwise movement in said sleeve,

said sleeve in the first position thereof retaining said detent means in said one position and in the second position thereof releasing said detent means so that they are free to move to the other position thereof,

resilient means for urging said sleeve towards said first position, and a finger piece movably supported on said casing engageable with said sleeve for moving the same to said second position,

a rotary bearing member between the casing and the hollow tubular portion of the drive member, the elongate hollow tubular portion of said drive member projecting outwardly beyond said casing, and providing support for [said burr] *the* shank along a substantial portion of its length.

Re. 29,737

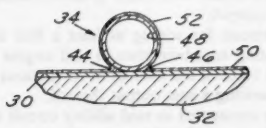
SOLAR COLLECTOR

Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116

Original No. 4,026,277, dated May 31, 1977, Ser. No. 586,612, Jun. 13, 1975. Application for reissue Aug. 1, 1977, Ser. No. 820,583

Int. Cl.[2] **F24J** *3/02*

U.S. Cl. 126—271 **5 Claims**



1. A solar collector comprising a housing, a steel plate within the housing to absorb sun rays and convert such rays to heat energy, steel tubing secured to the plate for conduction of heat energy from the plate to the tubing, said tubing being adapted for the flow of fluid therethrough to transfer heat energy from the solar collector to a point of use, a copper bond brazed in [an inert] *a reducing* atmosphere between said tubing and the plate forming both a mechanical bond and a heat conducting medium, and transparent plate means on the housing to permit sun rays to impinge upon the steel plate.

Re. 29,738

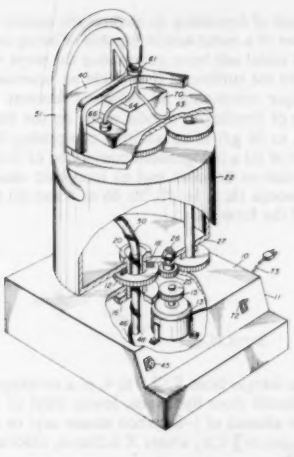
APPARATUS FOR PROVIDING ENERGY COMMUNICATION BETWEEN A MOVING AND A STATIONARY TERMINAL

Dale A. Adams, Rte. 8, Box 316-0, Tucson, Ariz. 85730

Original No. 3,586,413, dated Jun. 22, 1971, Ser. No. 810,310, Mar. 25, 1969. Application for reissue Aug. 23, 1977, Ser. No. 827,117

Int. Cl.[2] **G02B** *17/00;* **H01R** *39/00*

U.S. Cl. 350—6.5 **7 Claims**



4. Apparatus for providing fluid communication between a moving terminal and a stationary terminal comprising: a rotating platform having an axis of rotation; a rotating support extending from a stationary surface supporting said platform in spaced-apart relation to said stationary surface, said axis of rotation passing through said stationary surface, said rotating support having a second axis of rotation; said rotating platform having a far side facing away from said stationary surface and a near side facing said stationary surface; first means fixedly secured to said far side of said rotating platform for receiving or transmitting fluid; second means fixedly secured to said stationary surface for receiving or transmitting fluid transmitted or received by said first means; a rotating, flexible, fluid-carrying channel connected between said first and second means; said fluid-carrying channel extending from a point substantially at the axis of rotation of said far side of said rotating platform, out around the platform, to a point on said stationary surface which is substantially at the intersection of said axis of rotation of said rotating platform and said stationary surface, the axis of rotation of said fluid-carrying channel being coaxial with said axis of rotation of the rotating platform; means for rotating said platform and said fluid-carrying channel in the same direction coaxially about the axis of rotation of said rotating

platform and relative to each other in the ratio of 2:1, respectively.

Re. 29,739

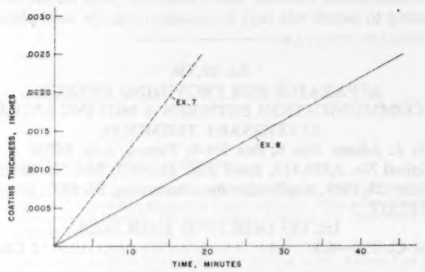
PROCESS FOR FORMING AN ANODIC OXIDE COATING ON METALS

Saul Kessler, Canoga Park, Calif., assignor to Joseph W. Aidlin, Los Angeles, Calif.

Original No. 3,996,115, dated Dec. 7, 1976, Ser. No. 607,127, Aug. 25, 1975. Application for reissue Feb. 3, 1977, Ser. No. 765,451

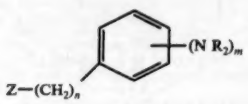
Int. Cl.[2] C25D *11/34, 11/26, 11/30*

U.S. Cl. 204—56 R **11 Claims**



1. A method of depositing an electrolytic anodic oxide layer on the surface of a metal article capable of being converted to a passivated metal salt layer comprising the steps of:

applying to the surface of the article an aqueous anodizing electrolyte containing an effective amount of oxidant capable of forming an anodic oxide on the metal surface and 0.1 to 50 g/l of an additive comprising the reaction product of (a) a halogenated compound of fluorine, chlorine, iodine or bromine and an inorganic cation selected from Groups 1b, 2, 3a, 4b, 5b, 6b or 8 and (b) an alkarylamine of the formula:



where n is an integer from [1] *0* to 4, m is an integer from 1–2 and R is selected from hydrogen, lower alkyl of 1–9 carbon atoms, lower alkanol of 1–8 carbon atoms, aryl or aralkyl and Z is [hydrogen or] CX_3 where X is fluoro, chloro, bromo, *or* iodo [or R]:

making the article the anode in the electrolyte;

applying a current density between 5 to 200 amps/dm^2; and depositing an anodic oxide layer on said surface.

Re. 29,740

COLOR CATHODE RAY TUBE OF THE PLURAL BEAM, SINGLE ELECTRON GUN TYPE

Susumu Yoshida; Akio Ohgoshi, both of Tokyo; Senri Miyaoka, Zushi, and Minoru Morio, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

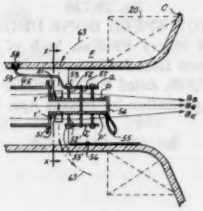
Original No. 3,548,249, dated Dec. 15, 1970, Ser. No. 796,838, Feb. 5, 1969. Application for reissue Nov. 1, 1976, Ser. No. 737,660

Claims priority, application Japan, Feb. 5, 1968, 43-6857

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—368 **9 Claims**

1. In a color cathode ray tube having means generating plural beams including a central beam and opposite side beams which originate in a common plane and which are directed, at predetermined incident angles to each other for convergence on a screen, through horizontal and vertical deflection fields produced by electromagnetic deflection means and by which said beams are made to scan said screen, the improvement comprising magnetic yoke means disposed *in advance of said electromagnetic deflection means to be in advance of all but the leakage flux of at least one field from the same and* wholly



within said tube adjacent the paths of said beams through said deflection fields and being operative to collect *said* leakage flux from one of said fields and to concentrate the collected leakage flux in a correction field through which only said central beam passes for correcting deviations between the rasters of said plural beams on said screen.

Re. 29,741

AIR-FUEL RATIO FEED BACK TYPE FUEL INJECTION CONTROL SYSTEM

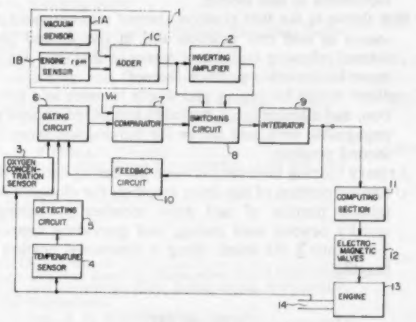
Hideaki Norimatsu, Kariya, and Susumu Harada, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Original No. 3,916,170, dated Oct. 28, 1975, Ser. No. 463,369, Apr. 23, 1974. Application for reissue Mar. 23, 1977, Ser. No. 780,644

Claims priority, application Japan, Apr. 25, 1973, 48-47486; Jun. 28, 1973, 48-73454

Int. Cl.[2] G06G *7/70;* **F02M** *7/00*

U.S. Cl. 364—431 **22 Claims**



1. An air-fuel ratio feedback type fuel injection control system comprising a main feedback circuit and a holding means; said main feedback circuit including:

an oxygen concentration sensor for detecting the concentration of oxygen contained in the exhaust gases of a vehicle internal combustion engine;

a comparator for comparing the output of said oxygen concentration sensor with a first predetermined value to generate an output;

an adder circuit for adding at least a first detected value representing an intake state in said engine and a second detected value of the number of revolutions of said engine and generating a sum output thereof;

an inverter connected to said adding circuit to generate an inverted output of said sum output;

a switching circuit connected to said comparator, said adder

circuit and said inverter and responsive to the output of said comparator for selecting and generating either of said sum output and said inverted output as an output thereof;

an integrating circuit connected to said switching circuit for integrating the output of said switching circuit to generate an integrated output;

an electronically controlled fuel injection means connected to said integrating circuit and said engine and adapted for injecting a fuel amount corresponding to at least one of operating parameters of said engine, whereby fuel amount to be injected is corrected in accordance with the output of said integrating circuit; and

said holding means being connected to said integrating circuit and said fuel injection means, and maintaining said integrated output at a second predetermined value except upper and lower saturation values of said integrated output when the correction of the injection fuel amount by said main feedback circuit is terminated.

PATENTS

GRANTED AUG. 22, 1978

ERRATA

For CLASS	See PATENT NO.
005–118	4,107,797
010–027 R	4,107,805
040–601	4,107,864
165–169	4,107,919
248–165	4,107,960
128–400	4,108,146
128–404	4,108,147
128–419	4,108,148
128–579	4,108,149
130–027 H	4,108,150
131–009	4,108,151
131–173	4,108,152
131–235 R	4,108,153
401–088	4,108,185
400–354	4,108,297
028–119	4,108,299
542–417	4,108,399
526–017	4,108,802
521–121	4,108,804
521–180	4,108,805
521–054	4,108,806
521–118	4,108,807
521–181	4,108,808
521–136	4,108,809
521–129	4,108,810
528–032	4,108,832
528–031	4,108,833
528–289	4,108,834
528–183	4,108,835
528–128	4,108,836
528–126	4,108,837
528–249	4,108,838
528–270	4,108,839
528–046	4,108,840
528–289	4,108,841
528–061	4,108,842
528–074	4,108,843
526–217	4,108,844
526–240	4,108,845
544–245	4,108,853
544–277	4,108,854
568–730	4,108,908
568–766	4,108,909
260–875	4,108,942
260–878 R	4,108,943

ERRATA – Continued

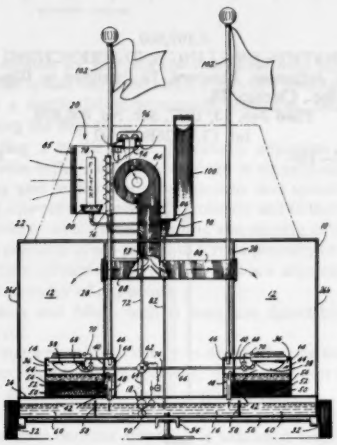
260–879	4,108,944
260–880 B	4,108,945
260–881	4,108,946
260–889	4,108,947
260–897 B	4,108,948
260–932	4,108,949
260–986	4,108,950
261–034 B	4,108,951
261–044 R	4,108,952
261–142	4,108,953
425–566	4,109,060
235–462	4,109,143
362–247	4,109,144
356–086	4,109,259

PATENTS

GRANTED AUGUST 22, 1978

GENERAL AND MECHANICAL

4,107,795
SELF-CONTAINED COMFORT STATION
William Edward Carter, Piedmont, S.C., and Italo Americo Cosentino, Huntingdon Valley, Pa., assignors to Modular Conceptual Systems, Inc., Ivyland, Pa., by said William E. Carter
Filed Aug. 18, 1975, Ser. No. 605,285
Int. Cl.[2] E03D *5/016;* **B01D** *1/16;* **B60R** *15/04*
U.S. Cl. 4—313 **16 Claims**



1. A self-contained comfort station including a building module having at least one toilet compartment therein, said toilet compartment including at least one toilet therein, means associated with said toilet for breaking down waste and paper to provide a relatively clean liquid effluent, a flush tank into which said effluent is discharged, evaporator means for removing excess effluent said evaporator means including means for filtering and aerating the effluent during evaporation, pump means operative to displace the effluent from said flush tank to said evaporator means when it is desired to remove excess effluent from said flush tank, control means for determining when excess effluent is present in said flush tank, and valve means responsive to said control means for directing the flow of effluent to said evaporator means when excess effluent is determined to be present in said flush tank by said control means.

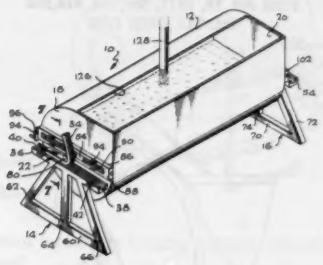
4,107,796
FLUSH TANK SYSTEM
Joel L. Nafziger, R.R. 1, Hopedale, Ill. 61747
Filed Mar. 18, 1977, Ser. No. 779,049
Int. Cl.[2] E03D *1/20*
U.S. Cl. 4—353 **16 Claims**

1. A flush tank system comprising the combination of:

a tank having a pair of opposite ends and an opening therein between the opposite ends, the tank being configured to laterally shift the center of gravity thereof as the tank is filled with fluid while in an upright position;

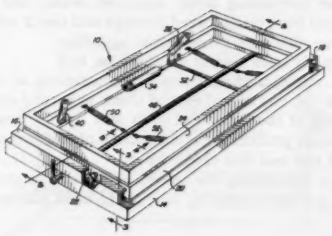
a pair of rockers, each having an outer surface having a relatively greatly curved portion thereof between opposite relatively slightly curved portions, the pair of rockers being coupled to the tank at the opposite ends thereof; and

a pair of support means disposed to receive the outer surfaces and to support different ones of the pair of rockers thereon and the tank extending therebetween, each of the rockers being operative to rock on its support means from one of the opposite slightly curved portions of the outer surface over the greatly curved portion to the other one of the opposite slightly curved portions to rotate the tank from the upright position into a discharge position when fluid in the tank laterally shifts the center of gravity



thereof a given amount and to rock from the other one of the opposite slightly curved portions over the greatly curved portion to said one of the opposite slightly curved portions to rotate the tank from the discharge position back into the upright position after fluid is discharged from the tank.

4,107,797
MATTRESS SUSPENSION SYSTEM
George E. Maxwell, Sr., 825 E. Sheridan, Phoenix, Ariz. 85006
Filed Jun. 10, 1977, Ser. No. 805,278
Int. Cl.[2] B62D *25/00*
U.S. Cl. 5—118 **10 Claims**



1. A mattress suspension system attachable to a horizontally oriented deck of a vehicle for substantially reducing the amplitude of fore-and-aft excursions and of up and down excursions which are transmitted by the vehicle to an individual reclining on a mattress positioned above said suspension system, said suspension system comprising in combination:

(a) a lower rectangular frame positionable above the deck and having first and second ends;

(b) an intermediate rectangular frame having first and second ends and including roller means on the first and second ends thereof, said roller means being coupled to said lower frame for permitting a limited amount of fore-and-aft travel but not tilting of said intermediate frame with respect to said lower frame in response to fore-and-aft excursions of the vehicle;

(c) an upper rectangular frame positionable above said lower and said intermediate frames and below the mattress; and

(d) damper means coupled to said upper and said intermediate frames for maintaining said upper frame above and in a fixed fore-and-aft position with respect to said intermedi-

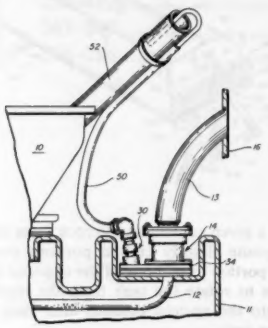
ate frame and for permitting damped up and down excursions but not tilting of said upper frame with respect to said intermediate frame in response to up and down excursions of said vehicle.

4,107,798

SELF-CONTAINED TOILET

Richard C. Lamb, Plantsville, and Robert C. Iwans, Farmington, both of Conn., assignors to Koehler-Dayton, Inc., New Britain, Conn.

Filed Jul. 18, 1977, Ser. No. 816,586
Int. Cl.[2] E03D *1/00*
U.S. Cl. 4—321 **2 Claims**



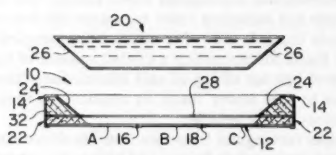
1. A self-contained toilet comprising
a collecting tank,
means for rinsing the interior of said collecting tank including
a rinsing manifold,
a rinsing conduit, and
a check valve operatively connecting said rinsing manifold and rinsing conduit, and
means for preventing liquid contained within said rinsing manifold from being forced through said check valve by a pressure differential threracross including
a normally open second check valve, and
check valve conduit means communicating at one end with one end of said second check valve and communicating at the other end with said rinsing means at a location proximate the connection of said rinsing manifold and said first check valve,
means for maintaining the second end of said second check valve and said collecting tank at the same pressure.

4,107,799

WATERBED AND FRAME WITH PLIANT SUPPORTING SIDES

Everette M. Lambert, Santa Clara, Calif., assignor to Liberty Vinyl Corporation, Santa Clara, Calif.

Filed May 2, 1977, Ser. No. 792,827
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—370 **11 Claims**



1. In a frame for a fluid filled mattress, said frame having a horizontally flexible bulkhead about a frame periphery, the improvement comprising longitudinally resilient retaining means secured under tension to opposing peripheral portions of said bulkhead and adapted to support from below said mattress for minimizing horizontal flexture of said bulkhead.

4,107,800

COMBINATION DRILLING AND WRENCHING TOOL

Arne Roy Jorgensen, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 13, 1977, Ser. No. 806,030
Int. Cl.[2] B26B *11/00*
U.S. Cl. 7—158 **6 Claims**

1. In a tool for securing a screw fastener including, in combination, a body with a driving member located at one extremity for receiving the head of an associated screw fastener, the driving member comprising surfaces adapted to transmit torque to said head, a sleeve member surrounding the torque transmitting surface comprising inner wall portions spaced radially from the torque transmitting surfaces so as to prevent torque transmitting contact between the associated fastener head and the sleeve, means for securely, but axially, adjustably mounting the sleeve member on the body so that the relative axial locations of the torque transmitting surfaces and workpiece engageable end surfaces of the sleeve may be readily varied, the mounting means comprising a ring member surrounding the body and including a helical thread configured on the outer surface thereof and a substantially cylindrical surface comprising the inner periphery adapted to rotate freely on a mating cylindrical surface of the body, the sleeve member including an internal thread configuration cooperating with the thread on the ring thereby adapted to selectively axially move the sleeve relative to the body, the body including abutment surfaces on either side of the mating cylindrical surface retaining the ring member from axial movement relative to body, means cooperating with the body, sleeve and ring to selectively clamp the ring into nonrotative position relative to the mating cylindrical surface during adjustment modes of the sleeve and relative to the sleeve during operative modes of the tool.

4,107,801

LOOP LENGTH CORRECTION OF SPIRALLY SET TEXTILE FABRIC IN PROCESSING APPARATUS

Yoshishige Tachibana, Akashi, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1977, Ser. No. 768,643
Claims priority, application Japan, Dec. 17, 1976, 51-152736
Int. Cl.[2] D06B 3/10, 17/00, 23/00
U.S. Cl. 8—152 28 Claims

1. A method for unifying the individual loop lengths of a continuous textile fabric fed along a path in a feeding direction through a textile fabric processing apparatus, said method comprising the step of:

providing a textile fabric processing apparatus having a squeeze roller assembly elongated in an axial direction,

passing said textile fabric successively and spirally around said squeeze roller assembly from one end to the other end thereof so as to cause squeezing and nipping of said fabric at a plurality of nip points, to form a plurality of loop-like portions of said fabric formed between adjacent ones of said plurality of nip points,

providing said fabric with at least one detectable portion thereof,

providing a plurality of detectors disposed along said path at respective ones of said plurality of nip points for detecting said at least one detectable portion,

stopping the feed of said fabric at each respective nip point when said detector disposed at said each respective nip point detects one of said at least one detectable portion of said fabric,

determining a point on that portion of said fabric backward adjacent with respect to said feeding direction, which point is spaced from said each respective nip point by a predetermined reference loop length,

correct feeding that portion of said fabric backward adjacent with respect to said feeding direction until said point determined by said determining step reaches a nip point backward adjacent to said each respective nip point, whereby the loop length of one of said loop-like portion is corrected to said reference loop length,

releasing said stoppage of that portion of said fabric backward adjacent with respect to said feeding direction, and

repeating said steps above with respect to other loop-like portions.

4,107,802

APPARATUS FOR RELEASING SUBMERGED FLOATS

Jean-François Patinet, Paris, and Claude Guiomard, Les Lilas, both of France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris", Paris, France

Filed May 19, 1977, Ser. No. 798,428
Claims priority, application France, May 25, 1976, 76 15782
Int. Cl.[2] B63C 11/00
U.S. Cl. 9—400 3 Claims

1. Apparatus for the controlled release of a submerged float which is releasably fastened to undersea structure, comprising in combination,

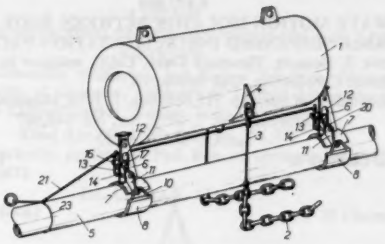
a support member connected to said float and provided with a slot formed therethrough,

a double-piece collar designed for fastening said float and said structure to one another, said collar comprising a first collar piece fast with said support member, a second collar piece, means at one end of said second collar piece for hinging the same to said first collar piece, and a hooking lug at the other end of said second collar piece,

a hook member having a hooking head designed for engaging said hooking lug and an opposite tail threaded through said slot,

a locking lever fulcrumed onto said support member and provided with a notch for engagement by said tail to lock said hook member in hooking position with said hooking lug, and

a control member attached to said locking lever to actuate the same out of engagement with said tail of said hook member, whereby said hooking head and hooking lug are disengaged from one another and said second collar piece is allowed to swing about said hinging means for release of said collar from said structure.

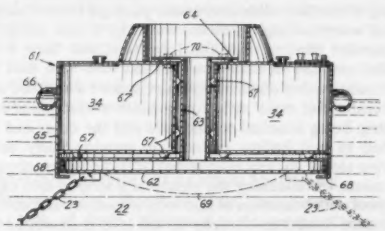


4,107,803

SEA TERMINAL

Leroy M. Sylverst, 910 Riverside Dr., New York, N.Y. 10032

Division of Ser. No. 730,109, Oct. 6, 1976, Pat. No. 4,067,080, which is a continuation of Ser. No. 529,651, Dec. 4, 1974, abandoned. This application Aug. 25, 1977, Ser. No. 828,008
Int. Cl.[2] B63B 21/52
U.S. Cl. 9—8 P 7 Claims



1. A self-contained terminal for the storage of products at sea and for the transference of products between a cargo vessel and said terminal comprising a first structure, positioning means carried by said first structure for maintaining said terminal at a preselected location, a second structure having a generally cylindrical configuration formed with an outer side wall, a top wall, a bottom wall and a cylindrical inner wall about a central vertical axis, said first structure including a base member and a central member extending from the center of said base member within said second structure along said vertical axis, said second structure being rotatable about said central member, means mounting said second structure in rotatable relationship about said central member with respect to said first structure for maintaining said second structure in said preselected location while permitting relative rotational movement between said second and said first structures, and limiting means for limiting the vertical movement between said first and second structure, said second structure including at least one product storage container, mooring means carried by said

second structure and positioned eccentrically with respect to said central member for mooring a vessel to said terminal, and at least one product transfer means carried by said second structure independently of said mooring means and positioned eccentrically with respect to said central member for the transfer therethrough of product between said product storage container and the vessel.

4,107,804

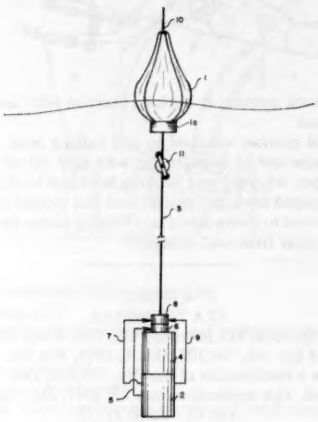
WAVE MOTION ISOLATOR BETWEEN BUOY AND CABLE-SUSPENDED INSTRUMENTATION PACKAGE

Derek J. Bennett, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 721,054, Sep. 7, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,907

Int. Cl.[2] B63B *21/52*

U.S. Cl. 9—8 R **8 Claims**



1. A wave motion isolator for dynamically compliant suspension of a submersible instrument package from a buoy in a body of water having significant waves by a cable comprising: two parallel bars; an axle fixed between said bars; a spool mounted on said axle to turn between said bars; said spool being comprised of a hollow cylinder spaced about said axle; a high-tensile, flat metal strip formed into a spiral, one end of said strip being attached to said axle and the other end being attached to said hollow cylinder to provide fairly uniform restoring torque for any revolutions of said cylinder about said axle; means for attaching the center of a loop in said cable to said spool with both sides of said loop wound around said spool in the same direction; whereby as said loop is unwound under increasing tension of cable at both ends of said loop in opposite directions, said metal strip functions as an energy storing means being connected to said spool and said bars to rewind said loop on said spool under decreasing tension of said cable at both ends of said loop; and at least two guide sheaves mounted between said bars, one on each side of said spool for guiding said cable at opposite ends of said loop past ends of said bars and preventing said bars from rotating as said loop of cable is wound and unwound under varying tension by operation of the rewinding energy restoring means on said spool.

4,107,805

RIVET MAKING METHOD AND RIVET

Leo E. Gatzek, 5825 Alcove, North Hollywood, Calif. 91607

Filed May 9, 1977, Ser. No. 794,935

Int. Cl.[2] B21K *1/58*

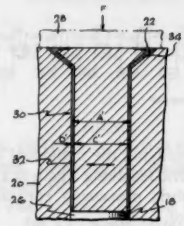
U.S. Cl. 10—27 R **3 Claims**

1. The method of making a high-strength corrosion resistant rivet comprising the steps of:

forming a rivet blank having a high-strength core and having a metallurgically bonded uniformly thick exterior cladding layer of higher corrosion resistance than the core;

placing the rivet blank in a heading die which has a shank bore larger than the rivet blank by about 0.0005 inch; and

forming the rivet blank into a rivet by striking the rivet blank with a header punch while the rivet blank is in the heading



die to simultaneously expand the rivet blank into the bore of the die, from the head on the rivet and cause hydrodynamic flow of cladding material, part of such cladding material flowing out of the shank bore and around and onto the top of the head of the finished rivet so that there is more clad volume on the head after the strike than there was on the corresponding length of the rivet blank before the strike.

4,107,806

ANCHORING DEVICE

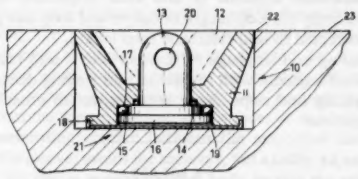
Robert Andrew Newland, and Wallace Richard Leeke, both of Watsons Ln., Newrybar, New South Wales, 2479, Australia

Filed Apr. 27, 1977, Ser. No. 791,248

Claims priority, application Australia, Oct. 28, 1976, 7921/76

Int. Cl.[2] A63C *15/06*

U.S. Cl. 9—310 E **4 Claims**

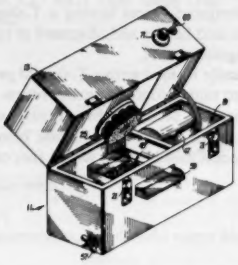


1. An anchoring device adapted to be contained within and cemented into a cavity formed in the topside of a surfboard and including, a hollow body part arranged substantially symmetrically about a central normally vertical axis; a post having its upper end apertured for connecting a cord or the like thereto and supported co-axially and rotatable within and by said body part for rotation about said axis and said part being substantially symmetrical thereabout; an outwardly radially extending base flange on said post to prevent retraction of said post through said body part in an upwards direction, and an outwardly radially extending annular locating flange about the lower end of said body part, said locating flange having an outer diameter not greater than the outer diameter of the upper end of said body part, the upper interior face of which is dished inwards from the surface of the surfboard in the direction of the lower end of said post, forming a hollow surrounding said upper apertured end of said post.

4,107,807
PORTABLE TACK CLEANING MACHINE

Bernard J. Nash, Jr., P.O. Box 358A, Rte. 1, Glen Allen, Va. 23060

Filed Aug. 3, 1977, Ser. No. 821,378
Int. Cl.[2] A46B *13/04*
U.S. Cl. 15—21 C 10 Claims

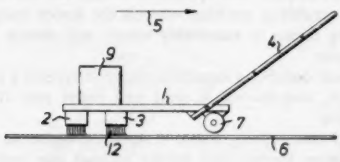


1. A tack cleaning machine comprising:
a housing;
a rotary, cleaning and scrubbing brush mounted in said housing and having bristles extending substantially parallel to the axis of rotation;
a rotary, cylindrical feeder-brush mounted in said housing for rotation on a horizontal axis and having outwardly extending radial brushes substantially perpendicular to the axis of rotation;
a cleaning fluid tank mounted in said housing, said feeder-brush being disposed above said tank so that said bristles thereof are adapted to extend into said cleaning fluid;
said cleaning and scrubbing brush being mounted contiguous to said feeder-brush so that the respective axes of rotation of said brushes are perpendicular to one another;
means to drive said brushes;
said housing having entrance and exit means to provide for ingress and egress of said tank, and disposed adjacent to the interface between said brushes.

4,107,808
DEVICE FOR PREPARING THE CLEANING OF CARPET FLOORS

Herbert Schröder, 65b Kadettenweg, 1000 Berlin (West) 45, Germany

Filed Dec. 29, 1975, Ser. No. 644,458
Int. Cl.[2] A47L *11/32*
U.S. Cl. 15—41 R 7 Claims

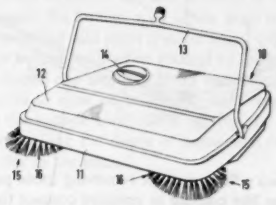


1. An apparatus for treating a carpet having a nap, said apparatus comprising a carrier displaceable over said carpet; means for displacing said carrier over said carpet in a predetermined transport direction; two brushes mounted on said carrier and having an elastic bedding and a multiplicity of individual wire bristles secured in said bedding and extending downwardly therefrom, whereby said bristles are engageable in said nap to loosen up the same, said bristles being elastically deflectable by said nap in said bedding, and said two brushes being spaced apart in said direction, the brush trailing in said direction having bristles which project downwardly further than the bristles of the leading brush, thereby effecting a raising of the nap of said carpet to an increasing extent in subsequent individual steps, by first loosening up said nap by the bristles of said leading brush and by completely raising said nap by the bristles of said trailing brush; and means for supporting said carrier on said carpet during displacement thereover with said bristles engaging through said nap.

4,107,809
CORNER SWEEPING BRUSH DISPOSED ON A FLOOR SWEEPER

Rolf G. Schuelein, Singhofen, and Rainer Friedrich, Nassau, Lahn, both of Germany, assignors to Leifheit International Guenter Leifheit GmbH, Nassau, Lahn, Germany

Filed Apr. 28, 1977, Ser. No. 791,985
Claims priority, application Fed. Rep. of Germany, May 17, 1976, 2621871
Int. Cl.[2] A47L *11/33*
U.S. Cl. 15—42 10 Claims

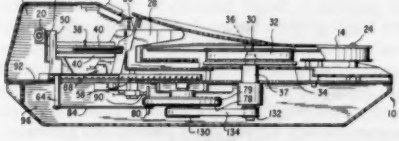


1. A floor sweeper, comprising a frame having a corner portion; a hub member mounted at said corner portion for rotation about an upright axis which is inclined to the horizontal, said hub member having a circumferential sideface and an underside facing toward a surface to be swept; an annulus of bristles on said sideface of said hub member and having free end portions which project downwardly beyond said underside so that, due to the inclination of said axis, only the bristles of consecutive increments of said annulus are in contact with the surface to be swept; and an annulus of radially extending teeth on said underside of said hub member and extending downwardly therefrom for engaging the surface to be swept so as to rotate said hub member.

4,107,810
MAGNETIC DISC CLEANING MACHINE

Anselm Francis Varni, Woodland Hills, and Joseph Sandor, Reseda, both of Calif., assignors to Innovative Computer Products, Tarzana, Calif.

Filed Oct. 4, 1977, Ser. No. 839,280
Int. Cl.[2] G11B *1/04*
U.S. Cl. 15—97 R 20 Claims



1. A magnetic disc cleaning machine for removing dirt, dust and other undesirable material from a magnetic disc surface comprising:
(a) a housing having outwardly extending flexible members configured to selectively engage a magnetic disc cartridge containing said magnetic disc; and

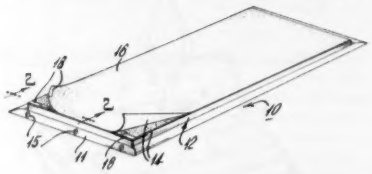
(b) a cleaning pad assembly disposed on said housing and including (i) at least one arm member having an associated cleaning surface and (ii) means for selectively moving said arm member and associated cleaning surface across said disc such that as said surface is moved across said disc, said cleaning surface engages a surface of said disc and removes dirt, dust and other undesirable material therefrom.

4,107,811

TACKY FLOOR MAT WITH IMPROVED PEELING PROVISION

Grant A. Imsande, Arlington, Tex., assignor to Arbrook, Inc., Arlington, Tex.

Filed Apr. 19, 1977, Ser. No. 788,942
Int. Cl.[2] A47L *23/22*; B32B *7/06*
U.S. Cl. 15—215 **3 Claims**



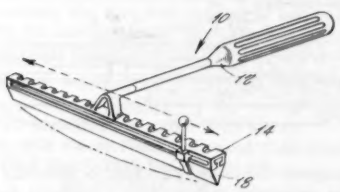
1. In a tacky floor mat for removing loose particles of dirt, dust and the like coming in pressure contact therewith of the type having a stack containing a plurality of superimposed adjacently adhered sheets, each sheet being substantially identical in size and having a pressure-sensitive adhesive layer on substantially the entire upper surface thereof, with the lower surface of each sheet being less adhesively treated than said upper surface of each sheet so that said adjacently adhered sheets are peelable from each other in descending order, wherein the improvement to initiate the peeling of each sheet comprises: a thin coating of non-adhesive material being print deposited on top of said adhesive layer in at least one corner of said upper surface of each sheet to render said upper corner non-adhesive to facilitate peeling of said sheet, said non-adhesive coating being a different color than the color of each of said sheets to readily indicate the section whereupon said peeling is to originate, said coating comprising an ink for color, an adhesive coating ingredient and silicone for adhesive release properties.

4,107,812

SQUEEGEE WITH MOISTURE REMOVING MEANS

Joseph R. Lantto, 702 Fourth Ave. NW., Buffalo, Minn. 55313

Filed Jul. 8, 1976, Ser. No. 703,692
Int. Cl.[2] A47L *1/08*
U.S. Cl. 15—245 **2 Claims**



1. A squeegee comprising:

an elongated handle having an elongated blade holder disposed transverse thereto, said blade holder being formed with a first elongated recess having a T-shaped cross-section,

an elongated squeegee blade formed with an elongated projection on a side opposite the working edge thereof, said projection having a T-shaped cross-section matching the cross-section of said elongated recess for slidingly fitting into the latter, whereby said blade is interchangeable with another blade,

a second elongated recess having a T-shaped cross-section formed in said holder and, disposed at right angles to said first elongated recess,

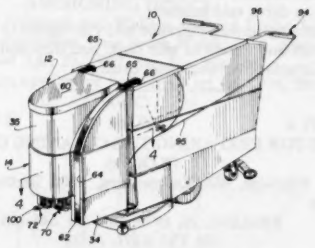
a second handle formed with a T-shaped projection slidingly fitting into said second elongated recess, said second handle having a blade-gripper fitting over said blade, whereby upon said second handle being slid along said second recess said blade is wiped free of moisture.

4,107,813

WAX-STRIPPER AND APPLICATOR DEVICE

Richard J. Torres, 1025 Grevelia St., South Pasadena, Calif. 91030

Filed Aug. 19, 1977, Ser. No. 826,153
Int. Cl.[2] A47L *11/03*
U.S. Cl. 15—246 **10 Claims**



1. A wax-stripper and applicator device for use with an automatic scrubbing machine, wherein the device comprises:

attaching means to removably mount said device to said machine;

a first tank defining a storage chamber to receive a solution therein, and having at least one outlet port disposed therein;

a second tank defining a second storage chamber to receive a solution therein, and having at least one outlet port disposed therein, said second tank being supported by said first tank and being removable therefrom;

a pump means operably mounted to said device and connected to each of said chambers of said tanks to receive solution stored therein;

a first valve means operably disposed between said first chamber and said pump means;

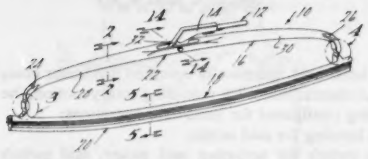
a second valve means operably disposed between said second chamber and said pump means; and

an adjustable spray means mounted to said pump means, whereby said solutions in said tanks can be selectively sprayed therefrom.

4,107,814
WINDSHIELD WIPER CONSTRUCTION

Johan H. vanden Berg; Alex H. van Eekelen, both of Hasselt, and Albert G. Hoebrechts, Mechelen-Bovelingen, all of Belgium, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Division of Ser. No. 438,038, Jan. 30, 1974, Pat. No. 3,978,544.
This application Aug. 19, 1976, Ser. No. 715,993
Int. Cl.[2] A47l *1/00*; B60S *1/02*
U.S. Cl. 15—250.42 **1 Claim**



1. A one-piece monolythic windshield wiper blade construction comprising,

an elongated flexor section adapted to operatively support a wiper element,

a bridge section formed integrally of said flexor section and including opposed end portions secured to longitudinally spaced portions of said flexor section and an intermediate portion adapted to be operatively secured to an associated wiper arm or the like,

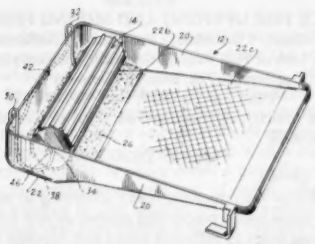
said opposed end portions of said bridge section comprising a first hinge means at one end of said blade construction and second and third hinge means at the opposite end of said blade construction,

each of said hinge means comprising first and second pairs of converging surfaces defining a reduced thickness portion arranged at right angles to the length of said blade construction, with one of said surfaces of each of said pair thereof lying substantially within a first imaginary plane and the other of said surfaces of each of said pair thereof lying substantially within a second imaginary plane, said first and second imaginary planes intesecting along a line colinear of the hinge axis of the associated of said hinge means.

4,107,815
TRAY HAVING PAINT TRANSFER ROLLER FOR PAD PAINTERS

Eugene F. Dumesnil, Jr., Glen Rrock, N.J., assignor to Tip Top Industries, Inc., Jersey City, N.J.

Filed Oct. 6, 1977, Ser. No. 840,257
Int. Cl.[2] B44D *3/12*
U.S. Cl. 15—257.05 **5 Claims**



1. A paint applicator for applying paint to a pad painter, said paint applicator comprising:

a. a paint tray having end, side and bottom walls defining a paint trough,

b. a paint transfer roller, and

c. mounting means for rotatably supporting the paint transfer roller on the paint tray for partial immersion in paint contained therein,

d. whereby moving the pad painter across the paint transfer roller causes said roller to rotate in contact with the paint and to transfer the paint from the paint tray to the pad painter,

e. said mounting means comprising a pair of interconnected hook-shaped clip elements which are adapted to be hooked onto the end wall of the paint tray, a pair of bearing elements which are adapted to support the transfer roller, and a pair of support arms extending from the clip elements and supporting the bearing elements,

f. said paint transfer roller being journaled to said bearing elements, portions of the support arms extending below the roller,

g. the hook-shaped clip elements being vertically elongated to adjustably support said paint transfer roller on end walls of different heights formed on paint trays having paint wells of different depths,

h. the vertical dimensions of said hook-shaped clip elements being sufficient to enable the said portions of the support arms to engage the bottom wall of the paint tray,

i. thereby preventing said paint transfer roller from rubbing against said bottom wall when rotated by the pad painter,

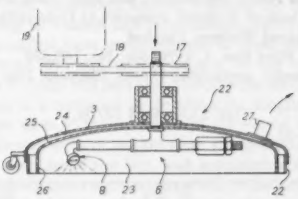
j. said hook-shaped clip elements being vertically slidable on the end walls to raise or lower the paint transfer roller relative to the surface level of the paint in the paint well,

k. thereby controlling the depth of immersion of the paint transfer roller in the paint.

4,107,816
CLEANING HEADS

Paul William Matthews, Hadleigh, England, assignor to Babcock Kina Limited, Hadleigh, England

Filed Dec. 22, 1976, Ser. No. 753,470
Int. Cl.[2] A47L *7/00*
U.S. Cl. 15—320 **1 Claim**

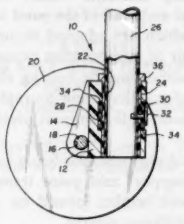


1. A cleaning head including a dished casing open at a base portion thereof, bearing means co-axially mounted on the dishes casing, a cleaning liquid supply tube axially rotatably extending though the bearing means and dished casing and connected to a source of cleaning liquid, a cleaning liquid supply arm extending radially from the cleaning liquid supply tube adjacent the base portion of the dished casing, a cleaning liquid discharge nozzle extending perpendicularly from the cleaning liquid supply arm adjacent the dished casing, means for rotating the cleaning liquid supply arm, means for dynamically balancing the cleaning liquid supply arm and means for movably supporting the dished casing with the base adjacent a surface to be cleaned, a first flexible skirt and a second flexible skirt mounted on the dished casing and extending toward the surface to be cleaned, with a region bounded by said first and second flexible skirts connected to exhaust means to produce a suction effect within the region relative to spaces external of the region both within the casing and outside the casing.

4,107,817
SWIVEL ASSEMBLY

James L. Sloan, Avon, and Greg W. Meeker, Rochester, both of N.Y., assignors to Cross River Products, Inc., Rochester, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,556
Int. Cl.[2] B60B 33/00
U.S. Cl. 16—20 4 Claims



1. An improved swivel assembly rotatably mounted on a stationary leg of a cart or the like comprising:

a yoke having at least one load bearing shoulder, a vertically extending first opening for receiving a leg journaled therein about which said yoke rotates, and a horizontally extending second opening laterally spaced from said first opening for rotatably supporting the shaft of a wheel;

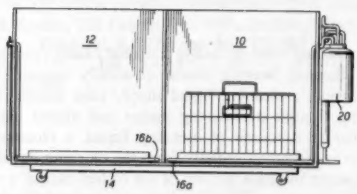
abutment means encircling the leg with a portion of said abutment means positioned adjacent said load bearing shoulder; and

means for rigidly securing said abutment means to the leg whereby said portion of said abutment means cooperates with said shoulder for preventing disengagement of the leg from said yoke and for transmitting the load of the cart to said yoke.

4,107,818
ANIMAL EUTHANASIA

Walter Norris Scott, Letchworth, and Judy Anne MacArthur, Salisbury, both of England, assignors to Universities Federation for Animal Welfare, England

Filed Dec. 7, 1976, Ser. No. 748,335
Claims priority, application United Kingdom, Dec. 11, 1975, 50765/75
Int. Cl.[2] A61M 16/00
U.S. Cl. 17—51 10 Claims



1. A method for the euthanasia of small animals which comprises filling a first chamber with a regulated mixture of gases in predetermined proportions containing not less than 40% carbon dioxide and sufficient oxygen to prevent the animal from having convulsions but not more than 50% oxygen, filling a second chamber in a regulated manner substantially wholly with carbon dioxide, after establishment of the correct gas mixture placing the animal in the first chamber and leaving it in said chamber until fully anaesthetised, and then transferring the animal to the second chamber until life is extinct.

4,107,819
HAND-HELD, ELECTRICALLY OPERATED FISH SCALER

Floyd S. Salzon, 8880 Darby Dr., Baton Rouge, La. 70896

Filed Jan. 3, 1977, Ser. No. 755,960
Int. Cl.[2] A22C 25/02
U.S. Cl. 17—64 1 Claim

1. A hand-held, electrically operated fish scaler comprising:

(a) An electric motor for providing rotary motion, the motor being configured for hand-held operations;

(b) a housing for said motor;

(c) a switch for actuating said motor, said switch being configured in association with said housing for preventing inadvertent actuation thereof;

(d) a descaling tool rotated by the motor for engaging the scales of a fish, the descaling tool including a shank and a teeth defining member secured to the shank, the shank extending through an opening in the housing and removeably secured to the motor for rotation about the axis of the shank, and the member providing rows of teeth circumferential of said axis to thereby provide rows of cutting edges;

(e) one of said rows disposed substantially at the end of the teeth defining member opposite the shank, adjacent rows of edges at different radii from said axis to provide an oval periphery of cutting edges, adjacent teeth in the rows separated by longitudinal slots and adjacent rows separated by transverse grooves having groove bottoms shaped substantially in said oval configuration, the adjacent grooves having their respective bottoms at different radii from said axis;

(f) each said tooth being defined by a front wall, a rear wall, an upper surface, and a pair of side walls, said front walls of the teeth lying in non-radial planes with respect to said axis, thereby providing either negative or positive rake;

(g) annular structure secured to the housing and disposed within said opening for providing bearing support to said shank and for maintaining a seal between the housing and the shank; and

(h) a substantially transparent shield fixedly disposed with respect to the source of power and adjacent said descaling tool for deflecting scales during operation of the fish scaler.

4,107,820
DEVICE FOR OPENING AND MIXING FIBER BALES

Gunter Mahrt, Oberstimm, and Georg Goldammer, Gaimersheim, both of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 802,818
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626648
Int. Cl.[2] D01G 13/00
U.S. Cl. 19—81 9 Claims

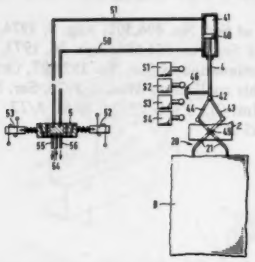
1. A device for removing fibers according to predetermined mixture ratios with a pincer-like gripper device which picks off fibers from bales of different fibers and deposits said fibers at another location, said device comprising:

drive means for effecting the opening and closing of said pincer-like gripper device for removing fibers from said bales of different fibers;

means operably connected to said drive means for limiting the opening of said pincer-like gripper device to a first predetermined width for removing fibers constituting the

smallest ratio of said desired mixture ratio when picking off fibers from one of said bales;

means operably connected to said drive means for limiting the opening of said pincer-like gripper device to a second predetermined width for removing fibers from another bale of different fibers constituting a larger ratio of said mixture ratio; and



said second width of opening of said pincer-like gripper device being greater than said first width so that the individual pickoffs from the bale calling for a larger ratio is greater than the individual pickoff from said bale of said one type of fibers.

4,107,821
DRAWING DEVICE FOR SLIVER

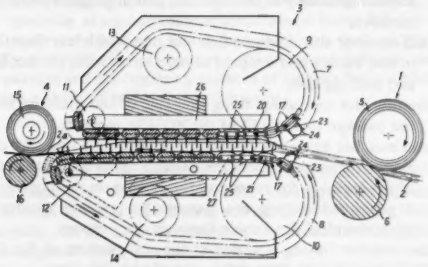
Jean Frédéric Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, France

Filed Oct. 22, 1976, Ser. No. 734,969

Claims priority, application France, Oct. 28, 1975, 75 32864; Jul. 15, 1976, 76 21611

Int. Cl.² D01G *19/10*

U.S. Cl. 19—127 **11 Claims**



1. A device for drawing sliver comprising two endless elements moving in unison and one located above the other and forming therebetween a working zone through which the sliver passes for the control and retention of the sliver, at least one of said two endless elements comprising an assembly, said assembly comprising a pair of laterally spaced endless chains mounted for movement on a closed circuit with a portion of the circuit traversing the working zone, a plurality of transverse bars extending between said pair of endless chains and being hinged relative to one another by said endless chains, each of said transverse bars having a convex cylindrical active surface facing inwardly toward the other said endless element as said transverse bars traverse the working zone, the convex cylindrical active surface of said transverse bars forming a materially continuous apron in the working zone, the convex cylindrical active surface of said transverse bars each having a crown portion located closest to the other said endless element as said transverse bars traverse said working zone with the crown portion forming a contact surface for the sliver, a plurality of penetration members formed on and projecting outwardly from said convex cylindrical active surface toward the other said endless element as said transverse bars traverse the working zone, said penetration members being offset in the direction of movement of said endless elements through the working zone from the crown portion of said convex cylindrical active surface on which they are located, only one of said two endless moving elements comprising said transverse bars, and the other of said two endless moving elements is constituted by a succession of transverse bars hinged to one another and having grooves for the passage of said penetration members of said one endless moving element and smoothed raised portions for controlling the sliver.

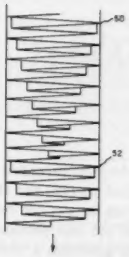
4,107,822
PROCESS FOR MAKING A BATT OF MODIFIED BASIS WEIGHT PROFILE AND LENGTHWISE UNIFORMITY

Roger Alan Brown, 2131 Elm Hill Pk. C-54, Nashville, Tenn. 37210

Filed Jun. 8, 1977, Ser. No. 804,854

Int. Cl.² D04H *1/00*

U.S. Cl. 19—163 **1 Claim**



1. In the process of cross lapping a fibrous web onto a horizontal conveyor surface moving laterally to the direction of web laydown to form a batt, the improvement which comprises cross lapping the web onto the batt conveyor surface from a horizontal laydown surface moving back and forth across the batt conveying surface, varying the length of the cross-lapping movement in a programed cycle of operation to obtain a modified basis weight profile in cross sections of the batt produced by varying the length of the cross-lapping movement to form full laps alternating with different sizes of smaller laps in a repeating cycle along the length of the batt, wherein the sizes of the smaller laps are varied to provide a gradual increase in basis weight from side portions of the batt to central portions of the batt, and maintaining the batt conveyor speed at a value equal to the width of the web divided by the time required to complete one cycle of operation.

4,107,823
BELT HOLDING CLIPS, PARTICULARLY FOR KEYS, TOOLS AND THE LIKE

Joseph T. Siesto, 8200 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Oct. 3, 1977, Ser. No. 838,637

Int. Cl.² A44B *15/00*

U.S. Cl. 24—3 K **6 Claims**

1. Belt holding clip to hold attachment such as keys, tools, or the like comprising

a single elongated unitary loop element of resilient material having

an essentially flat back strip portion (10);

a pair of bent-over connecting portions (11, 12) extending away from the face of a back strip portion (10);

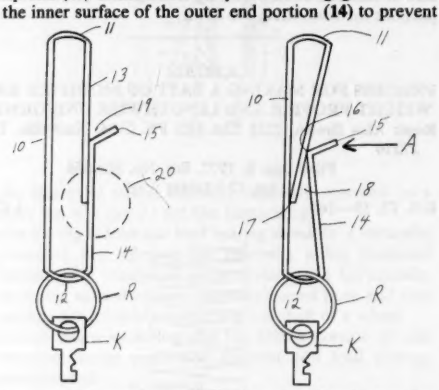
and two end portions (13, 14) bent to be essentially parallel to said back strip portion (10) to form an essentially closed loop therewith

wherein, in accordance with the invention

the end portions overlap each other by a distance of at least in the order of about the spacing of said end portions (**13, 14**) from the back strip portion (**10**) and at substantially the center of said back strip portion;

the outer and upwardly extending one of said overlapping end portions being formed with an angled tip (**15**) extending away from the back strip portion and forming therewith a first access space (**19**),

bent-over connecting portions (**11, 12**) resiliently biasing the end portions (**13, 14**) against each other and pressing the tip end (**17**) of the inner end portion in engagement with the inner surface of the outer end portion (**14**) to prevent



removal of attachments threaded on the clip, the junction between the angled tip (**15**) and the outer end portion (**14**) forming a fulcrum to permit resilient deflection of the inner one (**13**) of the end portions against the back strip portion (**10**) and generate a second access opening for removal of attachments threaded on the clip, upon application of pressure against the outer end portion (**14**) in a direction towards said back strip portion (**10**) and wherein (FIGS. 7–11) the terminal part of the tip end (**77, 87, 97, 107, 117**) of the inner end portion (**13**) and the outer one of the overlapping end portion (**14**) are formed with respective interengaging projection and recess means, at least the inner tip end having a finished edge.

4,107,824

CLAMPING COLLAR

Michel Lussier, Vichy, France, assignor to Automobiles Peugeot and Hautrifil, Paris, France

Filed May 3, 1977, Ser. No. 793,297
Claims priority, application France, May 3, 1976, 76 13151
Int. Cl.[2] B65D *63/10*
U.S. Cl. 24—27 **2 Claims**

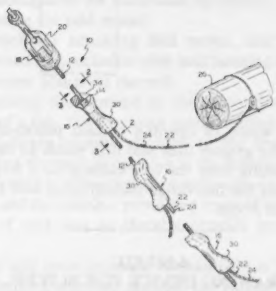
1. A clamping collar comprising a wire of elastically yieldable material forming a coil which has neighbouring end portions each of which end portions comprises hooking means and, beyond said coil, an intermediate bent portion between the coil and the hooking means, the curvature of each bent portion being opposed to the curvature of the corresponding end portion of the coil, and said hooking means are constituted by an end closed loop portion extending each one of the intermediate bent portions, each loop portion having an end portion which is bent, in the free position of the collar, to a side of its corresponding end portion of the coil opposite to the neighbouring end portion of the coil.

4,107,825

TAG LINE AND BUTT HOOK CONSTRUCTIONS

Franklin M. Brawand, 7706 SW. Florence La., Portland, Oreg. 97223

Continuation of Ser. No. 494,501, Aug. 5, 1974, which is a continuation of Ser. No. 354,696, Apr. 26, 1973, abandoned, which is a continuation of Ser. No. 192,087, Oct. 26, 1971, abandoned. This application Mar. 1, 1976, Ser. No. 662,358
Int. Cl.[2] F16G *11/14*; B66C *1/12*
U.S. Cl. 24—115 R **4 Claims**



1. In combination,

a tag line having a ferrule thereon,

a choker line having a nubbin of a predetermined diameter,

an elongated eye-like member having an enlarged transverse passage therethrough of a predetermined width sufficient to permit the nubbin to pass endwise therethrough and located generally at the central portion lengthwise of the member,

said member also having a first slot of a width less than that of said nubbin and adapted to receive both the choker line and said tag line,

the first slot extending along one side of the member from the passage to one end of the eye-like member,

said member having a second slot extending along said one side of the member from the passage toward the other end of the member for receiving the ferrule on the tag line in a position blocking the passage to prevent accidental withdrawal of the nubbin through the passage,

the member having a socket at the end portion of the first slot for receiving the nubbin on the choker line,

the member also having an eye-like opening from the second slot to said other end for the tag line and adapted to prevent passage of the ferrule therethrough,

the ferrule being of such a length and diameter as to block the passage when in the second slot,

a bridge on the other side of said member, spaced from said other end of said member and closing one side of the second slot and forming one side of a socket for receiving the ferrule,

the bridge forming one side of the passage,

the ferrule being positioned on the tag line intermediate the ends of the tag line and a pulling portion of the tag line at one end of the ferrule extending through the eye-like opening to hold the ferrule in the second slot in a position blocking the passage,

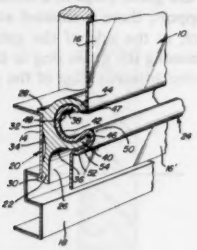
the member having opposed projections spaced apart a distance less than the diameter of the nubbin and positioned between the passage and the socket to form the side of the passage opposite to the bridge.

4,107,826

FLEXIBLE COVERING ANCHOR

Daryl D. Tysdal, P. O. Box 5286, Texarkana, Tex. 75501

Filed Jan. 23, 1978, Ser. No. 871,693
Int. Cl.[2] A44B 21/00; A47H 13/01
U.S. Cl. 24—243 K 9 Claims



1. A sheet material attaching assembly including a rigid, shape-retaining base member adapted to be attached to a support and having a substantially non-deformable, transverse configuration, said base having a channel defined therein for receiving a portion of sheet material therein, a rigid, shape-retaining material holding element including a first portion insertable into said channel and having a substantially non-deformable, transverse configuration similar to that of said channel whereby said element is nested in said channel when inserted therein, said channel being generally C-shaped in transverse configuration and said element portion being C-shaped in exterior transverse configuration and snugly receivable within said channel through the open side thereof with clearance between the opposing surfaces of said element portion and said channel to tightly receive a sheet of material therebetween, said element including, at the open side of said element portion, a reversely directed outer tongue portion overlying, extending lengthwise along and generally paralleling the corresponding side of said element portion and defining a pocket extending along and opening outwardly away from said open side, at least one side of said channel being defined by an arcuate arm portion of said base, said arm portion being snugly receivable in said pocket with clearance between said arm portion and the opposing surfaces of said pocket to tightly receive a sheet of material therebetween.

4,107,827

APPARATUS FOR PRODUCING SYNTHETIC FIBERS

Franz Sasshofer, Ried i.I.; Friedrich Gotschy, Vöcklabruck; Johannes Krässig, Seewalchen, and Adalbert Wimmer, Vöcklabruck, all of Austria, assignors to Chemiefaser Lenzing Aktiengesellschaft, Lenzing, Austria

Division of Ser. No. 642,016, Dec. 18, 1975, Pat. No. 4,025,598.
This application Mar. 9, 1977, Ser. No. 775,773
Claims priority, application Austria, Jan. 3, 1975, 20/75
Int. Cl.[2] B29C 17/10
U.S. Cl. 28—246 6 Claims

1. An apparatus for producing threads and fibers of synthetic materials, in particular of materials including high-melting, non-melting, difficult-to-dissolve and insoluble polymers, comprising:

a turning mechanism with a carriage and a spindle adapted to receive a cylindrically shaped body of synthetic material for rotation thereof;

a foil peeling knife secured to the carriage of the turning mechanism so as to peel off a layer of the synthetic material;

a scratching tool arranged to precede said foil-peeling knife in the rotation direction of said cylindrically shaped body of synthetic material and carrying a plurality of parallel scratching edges which are adapted to scratch the periphery of the cylindrical body of synthetic material so as to form a plurality of parallel grooves in that body; and

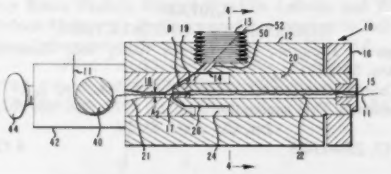
a guiding and transporting section arranged to follow said foil peeling knife and adapted to draw off a curtain of parallel threads peeled off by the foil peeling knife from the parallel grooves in the synthetic material, which guiding and transporting section includes stretching means for stretching the threads in at least one step.

4,107,828

YARN TREATING JET

Francis Joseph Clendening, Jr., and Elva Lincoln Rose, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 4, 1977, Ser. No. 793,850
Int. Cl.[2] D02G 1/16
U.S. Cl. 28—254 6 Claims



1. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a nozzle block having a conical surface entrance located in said bore at said outlet end, and a yarn guiding element extending into said bore from the yarn inlet end of the body, said element having a passage therethrough for guiding yarn from the yarn inlet of the body past the gas inlet through the exit end of said element to the conical entrance of the nozzle block, said nozzle block, said guiding element and the bore in said body forming an annular chamber in said body, the improvement for creating turbulence in said annular chamber comprising: a restriction joining said gas inlet and said chamber, said restriction having a central axis directed across the central axis of the yarn guiding element to intersect the conical surface entrance of the nozzle block at a location shielded from the restriction by the yarn guiding element whereby pressurized gas issuing from said restriction impinges on the surface of the yarn guiding element to create turbulence in said annular chamber.

4,107,829

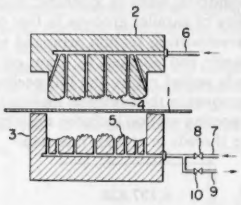
METHOD OF MANUFACTURING SEAT CUSHIONS

Muneharu Urai; Shuichi Goto, and Yutaka Fukui, all of Tokyo, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1977, Ser. No. 780,522
Claims priority, application Japan, Apr. 5, 1976, 51-37284
Int. Cl.[2] B68G 7/052, 7/06, 7/12, 15/00
U.S. Cl. 29—91.1 3 Claims

1. A method of manufacturing a seat cushion comprising the steps of placing a seat covering providing fabric material on a lower die disposed opposite to an upper die of shape complementary to that of said lower die, supplying steam by way of at least one conduit connected with said upper and lower dies thereby heating and wetting said fabric material, urging said upper and lower dies relative to each other to press said fabric material therebetween thereby forming a seat covering of bag-like structure, inserting a first filler pad of cushion provid-

ing material into the internal space of said seat covering of bag-like structure and bonding said first filler pad to said seat covering, bonding a second filler pad of cushion providing material having a density greater than that of said first filler pad to said first filler pad, mounting a frame together with



elements including springs on the assembly thus obtained, anchoring said seat covering to said frame at its peripheral edges, and including applying vacuum suction to said lower die so as to assist in the formation of said seat covering of bag-like structure by the steam supply.

4,107,830

ROLLING PIN CONSTRUCTION

George V. Thomson, 4400 Golden Valley Rd., Minneapolis, Minn. 55422

Continuation-in-part of Ser. No. 792,544, May 2, 1977, abandoned. This application Jun. 17, 1977, Ser. No. 807,356

Int. Cl.² A47J *43/04*

U.S. Cl. 29—110.5 **4 Claims**

1. A pastry roller consisting a rigid, elongated, terete body having a longitudinal axis, the diameter of said body being less at its ends than therebetween so that in a plane passing through said axis the edges of said body form smooth curves having greater curvature at one end of the body than at the other end of the body.

4,107,831

PRESSURE ROLLER

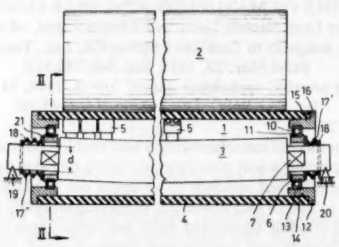
Armin Siegfried, Köniz, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Aug. 2, 1977, Ser. No. 821,093

Claims priority, application Switzerland, Aug. 10, 1976, 10160/76

Int. Cl.² B21B *13/02*

U.S. Cl. 29—116 AD **8 Claims**



1. Pressure roller with a non-rotatably mounted axial support about which a roller shell can rotate which is supported in a supporting plane on the support by hydrostatic supporting elements and is mounted to be rotatable and is guided axially and also radially at both ends by means of a guide ring arranged at each roller shell edge, the said guide ring being non-rotatable relatively to the support but capable of displacement axially and along the supporting plane, in which pressure roller, for holding the guide rings in a desired axial position relatively to the support, there is situated at each end of the roller shell a device, at the side of the guide ring, the said device elastically pressing the guide ring in the axial direction towards the respective adjacent edge of the roller shell.

4,107,832

METHOD FOR WINDING SPIRAL FINS ONTO OVAL TUBING

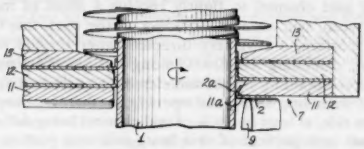
Alfred Joekel, Essen-Werden; Hans Langen, and Peter Denner, both of Ratingen, all of Fed. Rep. of Germany, assignors to Balke-Durr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 451,589, Mar. 15, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 569,887

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1974, 2436768

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 AH **6 Claims**



1. A method of producing finned heat transfer tubing of oval cross section, by winding a continuous metal strip around a length of oval tubing having a maximum diameter is at least fifty percent larger than its minimum diameter, in order to form a continuous spiral fin thereon, the method comprising the steps of:

rotating said length of oval tubing about its longitudinal axis;

feeding to at least one winding point on the circumference of said tubing, in a transverse tangential direction, a continuous strip of ductile sheet metal of an on-edge height equal to at least ten times its gauge, the strip or strips, respectively, being advanced through the rotation of said tubing by virtue of a starting attachment between the strip and tubing;

shaping the metal strip, or strips, prior to arrival at the winding point, into a hook-like cross-sectional profile, so as to give the metal strip a contact edge with a laterally extending flange portion which is bent substantially more than 90° into an acute angle with the remainder of the strip;

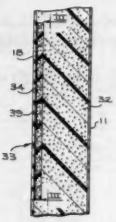
bending the metal strip, or strips, on edge against the circumference of the tubing under high tensile stress applied to said strip, while advancing the winding point or points, respectively, axially relative to the rotating tubing, so as to bend the strip into a spiral fin enveloping the tubing; and

guiding and ironing the laterally extending flange portion of the metal strip, or strips, during the bending step, so that said flange portion is flattened against the surface of the tubing.

4,107,833
STRUCTURAL SUPPORT FOR A REFRIGERATOR

J. Nelson Knight, Louisville, Ky., and Roger C. Turner, Arlington, Va., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 9, 1976, Ser. No. 749,087
Int. Cl.² B65D 25/00
U.S. Cl. 29—460 13 Claims



1. A method for forming a structural support in a refrigerator cabinet of the type employing in situ foamed polyurethane thermal insulation within the cabinet wall space, which method comprises:

attaching a body of fibrous material to the wall space side of a panel of the refrigerator cabinet;

injecting foam reactant material into the wall space; and

allowing expanding foam reactant material to penetrate and impregnate the body of fibrous material and to contact the wall sapce side of the panel to serve as an adhesive;

whereby, as the foam reactant material expands into insitu foamed insulation, the portion of the foam reactant material which penetrates and impregnates the body of fibrous material solidifies to form a strong, rigid support adhered to the panel by polyurethane material.

4,107,834
CAPACITORS WITH MINIMUM ESR AND METHOD OF MAKING THE SAME

James J. Kolkowski, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Dec. 20, 1976, Ser. No. 752,585
Int. Cl.² B01J 17/00
U.S. Cl. 29—570 2 Claims

1. A method of providing a plurality of electrolytic capacitors of a voltage rating and capacitance and having a minimum ESR at a standard frequency and for the rating and the capacitance,

wherein each capacitor has an anode foil and a cathode foil separated by a spacer and an electrolyte,

electrical connections to the foils,

said foils being disposed with respect to each other along a common length,

on the variables involved in a method of calculating the common foil length having said minimum ESR,

and wherein the foil length has an ESR of the square root of said electrolyte-spacer oxide and interface resistivity values divided by twice the resistivity of the capacitor foil, which method comprises

determining the tab and contact-to-foil resistance of the electrical connection to the capacitors,

the electrolyte-oxide interface value of the capacitors

and the cathode and anode resistivity of foil of each capacitor

measuring the characteristics of the capacitor components of each of the capacitors;

determining the minimum ESR at a standard frequency and for the rating and the capacitance and determining the constant foil length which is defined as the length of foil having an ESR of the square root of said electrolyte-spacer oxide and interface resistivity values divided by twice the resistivity of the capacitor foil,

and thereafter cutting a length of foil for each capacitor and for the rating to said constant foil length to provide the minimum ESR at the standard frequency with a minimum ESR foil length, oxide and resistivity taking into consideration the foil width to provide the respective capacitance of respective capacitors so as to provide foils of different widths but constant length for said plurality of capacitors each having capacitance in accordance with the foil width,

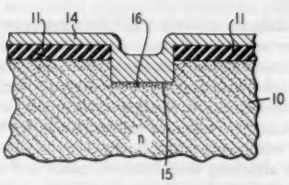
assembling the foils, electrolyte, spacers and tabs into capacitor bodies and encasing said bodies,

to provide a correlated plurality of capacitors having at least two different capacitances and of uniform voltage rating in said capacitors comprising the plurality of capacitors, all of which are related to each other in having a constant foil length and a minimum ESR at a standard frequency so that each capacitor is capable of operation at the standard frequency at an ESR which is not appreciably in excess of its lowest ESR at the standard frequency.

4,107,835
FABRICATION OF SEMICONDUCTIVE DEVICES

Jeffrey Bruce Bindell; Edward Franklin Labuda, and William Michael Moller, all of Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 11, 1977, Ser. No. 767,681
Int. Cl.² B01J 17/00
U.S. Cl. 29—590 9 Claims



1. In the process of making a semiconductive device, the method of making a surface barrier connection to a silicon wafer which comprises the steps of implanting the region underlying where the connection is to be made with dopant ions of the conductivity type already predominant in the region, the implanted ions having a concentration profile with a peak lying below the silicon surface, depositing over said region a layer of the contact metal which is to make the connection to a thickness greater than the depth of the peak of the profile of the implanted dopant ions, and heating the wafer for causing the metal to react with the silicon, the resultant interface advancing into the wafer beyond the location of the original peak whereby the peak is moved deeper into the wafer and there is formed a layer of dopant ions of higher peak concentration than originally implanted and the connection is made beyond the original peak of the implanted profile.

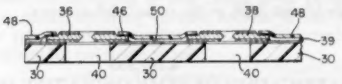
4,107,836
CIRCUIT BOARD WITH SELF-LOCKING TERMINALS

Joseph A. Roberts, Hudson, N.H., assignor to Advanced Circuit Technology, Merrimack, N.H.

Filed Jun. 22, 1977, Ser. No. 808,808
Int. Cl.² H05K 3/06
U.S. Cl. 29—625 7 Claims

1. A method of making a circuit board having at least one electrically conductive circuit pattern formed on a surface of said board, and at least one shaped aperture formed between said surface and the surface opposite thereto, said method comprising the steps of:

(A) providing a resiliently flexible metallic sheet material;
(B) removing material from selected areas on one surface of said metallic sheet while leaving (i) a substantially continuous metallic sheet having (ii) at least one raised area and (iii) at least one area of reduced cross-section bounded by said at least one raised area;
(C) providing a flexible dielectric sheet material having at least one aperture of approximate shape and location as said at least one raised area, and aligning and bonding said dielectric sheet material to said metallic sheet so as to cover said one surface of said metallic sheet at least in part while leaving substantially uncovered said at least one raised area;
(D) masking selected areas on the other surface of said metallic sheet so as to leave uncovered (i) one or more metallic patterns corresponding to said conductive circuits and (ii) areas opposite said raised areas;



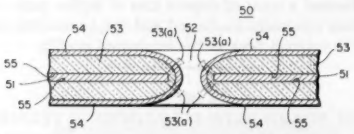
(E) plating the uncovered areas on both surfaces of said metallic sheet and removing said mask;
(F) chemically milling said metallic sheet employing the resulting plated areas as resist whereby metallic material is removed from said metallic sheet leaving behind one or more conductive circuit patterns and at least one shaped aperture;
(G) providing a relatively rigid dielectric panel having at least one aperture of approximate shape and location as said at least one aperture in said metallic sheet;
(H) positioning said metallic sheet and said dielectric panel so that said dielectric panel is adjacent said other surface of said metallic sheet and said apertures are substantially aligned with one another; and
(I) fixedly attaching said dielectric panel and said metallic sheet to one another.

4,107,837

METHOD OF FABRICATING A PRINTED CIRCUIT BOARD

Joseph Jawshin Chang, Ewing Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 7, 1977, Ser. No. 785,480
Int. Cl.[2] H05K *3/00*
U.S. Cl. 29—625 **7 Claims**



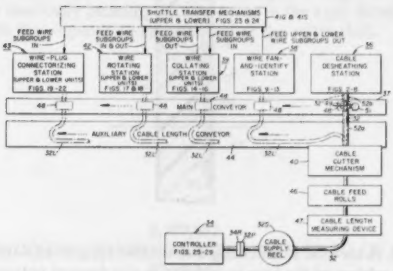
1. A method of preparing a printed wiring board, which comprises:
(a) forming a metal substrate having a thickness of from about 1 to about 7 mils and a through hole; and
(b) coating said substrate with a dielectric powder having a suitable flow length value within the range defined by the area extending between lines A and B in the graph of FIG. 2.

4,107,838

ARRANGING RANDOMLY POSITIONED ARTICLES INTO PRESELECTED POSITIONS

Ralph H. Keen; Raymond D. Kimsey, both of Arvada, and Gary G. Seaman, Broomfield, all of Colo., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,248
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—628 **45 Claims**


SHUTTLE TRANSFER MECHANISMS (UPPER & LOWER) FIGS. 23 & 24
FEED WIRE SUBGROUPS IN
FEED WIRE SUBGROUPS IN & OUT
FEED WIRE SUBGROUPS OUT
FEED WIRE SUBGROUPS IN
FEED UPPER & LOWER WIRE SUBGROUPS OUT
WIRE-PLUG CONNECTORIZING STATION (UPPER & LOWER UNITS) FIGS. 19-22
WIRE ROTATING STATION (UPPER & LOWER UNITS) FIGS. 17 & 18
WIRE COLLATING STATION (UPPER & LOWER UNITS) FIGS. 14-16
WIRE FAN-AND-IDENTIFY STATION FIGS. 9-13
CABLE DESHEATHING STATION
MAIN CONVEYOR
AUXILIARY CABLE LENGTH CONVEYOR
CABLE CUTTER MECHANISM
CABLE FEED ROLLS
CABLE LENGTH MEASURING DEVICE
CONTROLLER FIGS. 25-29
CABLE SUPPLY REEL

1. A method of arranging portions of electrical conductor wires which are initially in random positions into preselected positions on a wire-receiving member, which comprises:
connecting trailing portions of the wires to electrical reference points, representative of respective ones of the positions on the wire-receiving member, in a preselected numerical order which corresponds to a preselected numerical order of the positions on the wire-receiving member;
sequentially completing electrical circuits through the wires to the reference points from adjacent the randomly positioned wire portions, to identify the wire portions;
sequentially arranging each wire portion in an identified reference position within at least one randomly disposed, linear array, of wire portions on the wire-receiving member;
causing relative movement between the wire-receiving member and each identified wire portion of the linear array thereof in the reference position to locate the preselected position for the wire portion on the wire-receiving member adjacent the reference position, said relative movement, with the exception of the first-identified wire portion, being an amount representative of the difference between the numerical position of each wire portion while in the reference position and the preselected numerical position of the wire portion previously identified with an electrical reference point, and
feeding each identifed wire portion in an automated manner out of the reference position into its preselected position on the wire-receiving member after the preselected position has been located adjacent the reference position.

12. Apparatus for arranging portions of electrical conductor wires which are in random positions, into preselected positions, which comprises:
means for identifying the randomly positioned portions of the wires, and their relative positions;
means for connecting trailing portions of the wires to said identifying means;
means for energizing said identifying means by electrically contacting the wires in sequence adjacent the randomly positioned wire portions to complete electrical circuits through the trailing portions of the wires to said identifying means in sequence;
means connected to and responsive to said identifying means for arranging the randomly positioned wire portions into their preselected positions;
means for connecting the arranged wire portions to respective electrical terminals, and
means for automatically transferring the wire portions between said wire portion electrical contacting means, said

wire portion arranging means, and said wire portion connecting means.

4,107,839

MANUALLY GUIDED CUTTING MACHINE FOR SHEET MATERIAL

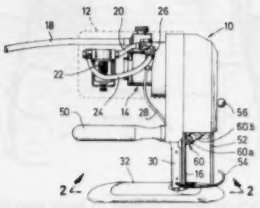
Rolf Jung, Waiblingen, Fed. Rep. of Germany, assignor to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,613

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 7614335[U]

Int. Cl.[2] B26D *1/10*

U.S. Cl. 30—123.3 **9 Claims**



1. A manually guided cutting machine for sheet material comprising, in combination, a frame including a downwardly extending column, a foot plate secured to the lower end of the column, the foot plate being of flat extensive construction for supporting the machine on a cutting table, the frame having a grip for manual guidance of the machine over the surface of the table, a driven knife blade at the front edge of the column for cutting sheet material overlying the foot plate, an air motor on the frame mechanically coupled to the knife blade, the air motor having an inlet connectable to a source of compressed air and having an outlet for exhaust air, and means defining a conduit for conducting exhaust air from the outlet of the motor to a centrally located confined recess under the foot plate free of any communication with the top of the plate so that the foot plate floats on a cushion of air and with the noise of the exhaust air being muffled by the foot plate and the overlying sheet material.

4,107,840

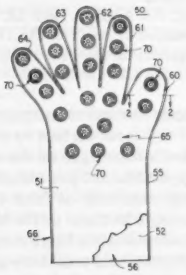
ABRASIVE HAND COVERING

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to Rub-A-Venture, Skokie, Ill.

Filed Jun. 6, 1977, Ser. No. 803,785

Int. Cl.[2] A47J *17/02*

U.S. Cl. 30—172 **23 Claims**



1. A hand covering comprising a synthetic organic resin front piece and back piece sealed at the peripheries thereof forming a hand holding envelope and an open ended gauntlet with a seam extending around the entire closed periphery thereof, at least one of said front and back pieces having a predetermined three dimensional formed shape, and a plurality of discrete one-piece synthetic organic resin abrading units each having a generally flat rear surface secured to said front piece and an abrasive front surface having a plurality of discrete substantially rigid scraping means extending therefrom.

4,107,841

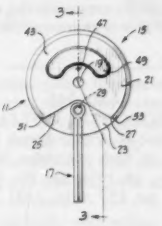
WEED CUTTER CONSTRUCTION

Charles F. Rebhun, Austinburg, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed Apr. 22, 1977, Ser. No. 789,950

Int. Cl.[2] A01D *55/18*

U.S. Cl. 30—276 **2 Claims**



1. Apparatus for cutting vegetation, said apparatus comprising:

a support disc including mounting means for mounting the disc for rotation in a generally horizontal plane about an axis, support means offset from said axis for receiving a single cutting blade, and counterbalance means for stabilizing said disc and any attachments thereon;

said support disc comprises a first portion having a relatively large thickness in the direction of said axis and a second portion having a relatively small thickness in the direction of said axis, the juncture of said first and second portions being defined by abutment surfaces, and said support means being disposed in said second portion; and

said blade being an elongated, substantially rigid plastic cutting blade including attachment means disposed at one end of said cutting blade for attaching said cutting blade to said support means for pivotal movement, said cutting blade extending radially outwardly from said axis and rotating about said axis in response to the rotation of said support disc to cut vegetation disposed in the path of said blade; and

said cutting blade being restricted to a predetermined range of movement within said second portion by said abutment surface.

4,107,842

EYELET REMOVING PUNCH

Thomas H. MacKeigan, Winchester, Va., assignor to Abex Corporation, New York, N.Y.

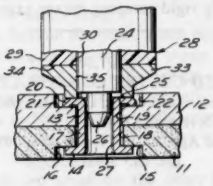
Filed May 27, 1977, Ser. No. 801,281

Int. Cl.[2] B26F *1/32*

U.S. Cl. 30—358 **1 Claim**

1. An eyelet punching device for removing eyelets which pass through aligned bores in a friction material and a metallic backing plate to securely fasten the friction material to the backing plate, comprising an axially movable cutting element, said cutting element sized smaller than the bore in the backing plate, a reduced diameter pilot on the cutting element which can fit within the center bore of the eyelet, the metallic backing plate having a cutting edge adjacent its bore, means for moving said cutting element axially to engage the end of said eyelet which engages the backing plate, said cutting element cooperative with the cutting edge to shear off said end of the eyelet as the cutting element is moved into the backing plate bore, said

cutting element sequentially passing through the sheared ends of the eyelet to prevent it from passing into the bores and pushing the eyelet body out of the aligned bores, and a stripper



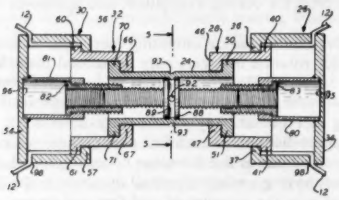
on the cutting element for removing the eyelet end from the cutting element after it is withdrawn from the backing plate bore.

4,107,843

ORTHODONTIC APPLIANCE

Raymond N. Spino, 264 W. Valley Brook Rd., and Casimir G. Warren, P.O. Box 94, both of Califon, N.J. 07830

Filed Sep. 24, 1976, Ser. No. 726,124
Int. Cl.[2] A61C 7/00
U.S. Cl. 32—14 E **14 Claims**



1. Biasing apparatus for use as a component of an orthodontic appliance, comprising:
(a) a first telescoping element;
(b) a second telescoping element;
(c) a central section having a first end and a second end, the first end of said central section being slidably received within said first telescoping element and the second end of said central section being slidably received within said second telescoping element;
(d) said first and second telescoping elements and said central section cooperating to define a cavity;
(e) operating means disposed within said cavity for causing displacement of said first and second telescoping elements between an extended position and a retracted position, said operating means being in threaded engagement with said first and second telescoping elements and in rotating sliding engagement with said central section; and
(f) access means formed in said first and second telescoping elements and said central section to provide access for an operator to said operating means.

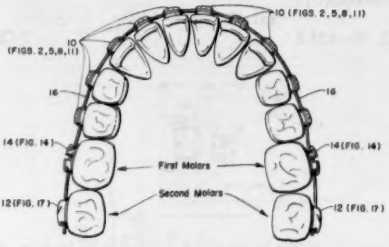
4,107,844

ORTHODONTIC APPLIANCE

Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291

Filed Nov. 15, 1976, Ser. No. 741,851
Int. Cl.[2] A61C 7/00
U.S. Cl. 32—14 A **14 Claims**

1. A fixed hybrid orthodontic arch wire appliance system comprising: a plurality of plastic brackets to be adhesively bonded to the labial surfaces of the anterior teeth of the maxillary or mandibular arch, a first pair of tubes to be adhesively bonded to the buccal surfaces of the first molars of said arch, and a second pair of tubes to be adhesively bonded to the buccal surfaces of the second molars of said arch; and an arch wire intercoupling said brackets and said tubes; each of said brackets including a transverse slot which receives said arch wire, the angulation of said slot being predetermined and measured so that the tooth to which the bracket is attached will assume the proper mesio-distal, labial-lingual and buccal-lingual angulation when the appliance is in place, each of said brackets having a peripheral groove and an elastic positioned in said peripheral groove to provide a stay for said arch wire,



each of said brackets being shaped to have smooth corners and rounded edges, each of said brackets having a base contoured to match the anatomy of the surface of the tooth to which the bracket is attached, and each of said brackets including metal reinforcing means embedded therein and positioned above and below said transverse slots; and each of said tubes of the first and second pairs being formed of metal, each of said tubes having a passage extending transversely therethrough for receiving the arch wire, and each of said tubes having a plastic base contoured to provide an intimate fit between each tube and its corresponding tooth.

4,107,845

DENTAL ADHESIVE COMPOSITES

Henry L. Lee, Jr., Pasadena, and Jan Alexander Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Continuation of Ser. No. 424,223, Dec. 13, 1973, abandoned, which is a continuation of Ser. No. 215,112, Jan. 3, 1972, abandoned. This application Dec. 16, 1976, Ser. No. 751,517
Int. Cl.[2] C08K 7/02
U.S. Cl. 32—15 **26 Claims**

1. An adhesive dental restorative composite coating material to be coated over a dry tooth surface by flowing it onto the surface and that is easily rearranged on the tooth surface without pressure after application and prior to curing, comprising a suspension consisting essentially of from 40% to 70% inorganic filler fibers having a hardness on the Mohs scale of 3.5 to 6 by weight of said composite in a liquid acrylate or substituted acrylate resin composition, said resin having a viscosity of less than 5,000 centipoises, said fibers being from 1 to 100 microns in length and having (a) diameters of from 1/20 to 1/5 their said lengths, respectively, and a peroxide catalyst and an accelerator for said resin, said composite coating material being selfcuring in place to form a cured hardened coating.

4,107,846

DEVICE FOR SUPPLYING COOLING AGENTS TO A DENTAL INSTRUMENT OF A HANDPIECE

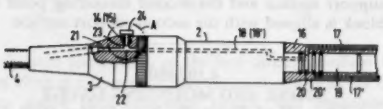
Ernst-Otto Fleer, Bensheim-Auerbach, and Erich Heubeck, Bensheim, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 2, 1976, Ser. No. 720,051

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542826

Int. Cl.[2] A61C 1/10

U.S. Cl. 32—27 4 Claims



1. In a hand-held dental device including

a handpiece having a center section,

a drive means in said center section,

said handpiece being adapted to engage one of two different handle sections, each said handle section being demountably connectable at a rear end thereof to a forward end of said center section, each said handle section further having

tool connection means at a forward working end thereof

a drivable shaft means rotatably supported therein and extending therethrough between said drive means and said tool connection means,

discharge nozzle means directed externally towards a dental tool positioned in said tool connection means, and

pathway means for conducting cooling agent to said nozzle means, one of said handle sections having external such passageway means, the other having internal such passageway means, and

flexible supply hose means terminably functionally associated with said handpiece opposite said center section and containing longitudinally extending therein both energy supply line means for said drive means, and also tube supply means for said cooling agent,

the improvement which comprises in combination:

(A) conduit means functionally connected to said cooling agent tube means and longitudinally defined internally through said handpiece to internal port means defined in a forward end portion of said center section and adapted for making functional engagement with said pathway means when said pathway means is internally contained in said handle section,

(B) a bypass passageway means extending from said conduit means to external port means defined in said handpiece, said port means being adapted for making functional engagement with said pathway means when said pathway means is external of said handle section,

(C) selective connection means arranged to open said external port means and concurrently close said internal port means, and reversably and alternatively to close said external port means and concurrently open said internal port means,

whereby cooling fluid is alternatively deliverable to said discharge nozzle means by one of said conduit means and said bypass passageway.

4,107,847

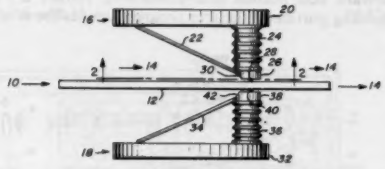
CONTACTING CALIPER GAUGE

Pekka Matti Typpo; Gunnar Wennerberg, both of Cupertino, and Tor Grotnes Larsen, Saratoga, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Mar. 3, 1977, Ser. No. 774,158

Int. Cl.[2] G01B 7/06

U.S. Cl. 33—147 L 5 Claims



1. A contacting caliper gauge for measuring the thickness of a moving sheet material, said sheet material moving from the anterior to the posterior of the gauge, said gauge comprises:

a first base to one side of said sheet;

a first skid between said first base and said sheet material, said skid having one end hinged to said first base near the anterior portion thereof;

a first means for elastically connecting the other end of said first skid to the posterior portion of said first base, said means defining an axis which is substantially perpendicular to the surface of said sheet;

a first cap attached to said first means adjacent said other end of the associated skid, said cap has a flat surface substantially parallel to said sheet on the posterior end thereof and a beveled surface near the anterior portion thereof;

a second base to the other side of said sheet;

a second skid between said second base and said sheet material, said skid having one end hinged to said second base near the anterior portion thereof;

a second means for elastically connecting the other end of said second skid to the posterior portion of said second base, said means defining an axis which is substantially perpendicular to the surface of said sheet and is substantially in linear alignment with said first means; and

a second cap attached to said second means adjacent said other end of the associated skid, said cap has a flat surface substantially parallel to said sheet on the posterior end thereof and a beveled surface near the anterior portion thereof.

4,107,848

PROFILER

James E. Boehnlein, Mentor, Ohio, assignor to PMC Industries, Inc., Wickliffe, Ohio

Filed Feb. 7, 1977, Ser. No. 766,009

Int. Cl.[2] G01B 7/28

U.S. Cl. 33—174 P 8 Claims

1. In a profiler, a profile tracing device comprising:

a support;

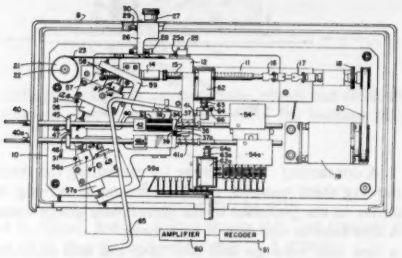
pivot means on the support;

a rocker carried by the pivot means for rocking about the axis thereof;

a stylus holding arm having a stylus holding portion adapted to hold a stylus which has a tracing edge for tracing the profile of the surfaces of an article;

means connecting the arm to the rocker, at a location spaced from said portion, for rocking of the arm with the rocker about said axis to and from a predetermined normal arm position, and for concurrent movement of at least the stylus holding portion of said arm, endwise of the arm, relative to the rocker, away from and toward said axis, to extended and retracted positions, respectively, during rocking of the rocker;

driving means, including a cam member and complementary follower member which are connected one member to the stylus holding portion and the other member to the support, drivingly interconnecting the support and the stylus holding portion of the arm and rendered operative, by rocking the arm away from said normal arm position, to extend the stylus holding portion of the arm progressively as the arm rocks progressively farther from normal arm position, and rendered operative by rocking the arm toward said normal arm position to retract the stylus holding portion of the arm progressively as the arm rocks



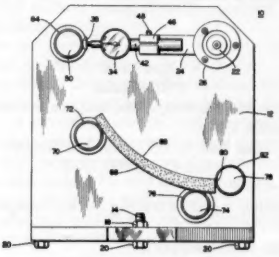
progressively nearer to said normal arm positions, said cam member having a profile surface engaged by the follower member, and shaped so that the tracing edge of a stylus carried by said arm portion is constrained by the members to follow, in each of said directions of rocking of the arm, a substantially lineal path tangent to the arcuate path which would be described by said edge were said edge swung about said axis at a constant radius equal to the distance from said edge to said axis in the normal starting position of the arm, and with the point of tangency of said path substantially at the location of said edge in said normal starting position of the arm.

4,107,849

TAPERED BLOCK THICKNESS GAUGE

W. Fred Lettau, Winchester, Va., assignor to Abex Corporation, New York, N.Y.

Filed Jun. 10, 1977, Ser. No. 805,256
Int. Cl.[2] G01B *5/24*
U.S. Cl. 33—174 E **5 Claims**



1. A gauging device for measuring the accuracy of the rate of taper of a tapered, arcuate brake block at a first measuring point and a second measuring point comprising:

a base plate;

a swing arm;

means for pivotally mounting the swing arm on the base plate;

an indicator means rigidly affixed to the swing arm for visually indicating the variation of the thickness of a brake block from a specified thickness;

a first rest bar mounted on the base plate and projecting perpendicular from it to provide a support surface for the brake block at the first measuring point, the first said support surface located from the axis of the swing arm mounting means a distance equal to the specified radius plus the specified thickness of the brake block at the first measuring point;

a second rest bar mounted on the base plate and projecting perpendicular from it to provide a second support surface for the brake block at the second measuring point, the second support surface located from the axis of the swing arm mounting means a distance equal to the specified radius plus the specified thickness of the brake block at the second measuring point and;

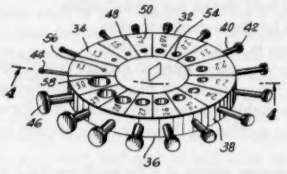
means for positioning the brake block so that the first measuring point on the brake block is aligned with the first support surface and the second measuring point on the block is aligned with the second support surface.

4,107,850

STONE AND MOUNTING GAUGE

Raphael Adler, 73-44 Vleigh Pl., Kew Garden Hills, Queens, N.Y. 11367

Filed Mar. 18, 1977, Ser. No. 778,889
Int. Cl.[2] G01B *3/46, 5/08*
U.S. Cl. 33—178 B **15 Claims**



1. A jeweler's mounting gauge for measuring the internal size of a stone mounting comprising:

a support assembly including a circular member having upper and lower surfaces and a circumferential wall surface therebetween;

a series of individual extended arms of uniform length angularly spaced apart about the periphery of the circular member and radially embedded in and extending from said circumferential wall of said support assembly; and

a disc-like foot permanently mounted on the outer end of each said arms concentrically therewith to lie in a plane perpendicular to the longitudinal axis of each arm and perpendicular to said upper and lower surfaces of said support assembly, the feet being successively larger in diameter.

13. A jeweler's mounting gauge for measuring the internal size of a stone mounting comprising: a support assembly; a series of individual arms extending in sequence from said support assembly, and a disc-like foot permanently mounted on the outer end of each said arm in a plane perpendicular to a longitudinal axis of each arm, the feet being successively larger in diameter, and further comprising selection means for selectively moving one of said arms between a retracted position and an operational extended position.

4,107,851

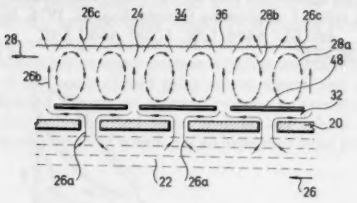
METHOD OF AND APPARATUS FOR FLUIDIZATION

István Tákacs; György Fábry; László Pap, and György Kiszely, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Dec. 2, 1976, Ser. No. 746,671
Claims priority, application Hungary, Dec. 9, 1975, RI 582
Int. Cl.[2] F26B *3/08;* F27B *15/00*
U.S. Cl. 34—10 **10 Claims**

1. A method of fluidizing particulate material, comprising the steps of introducing particulate material to be fluidized into

a fluidized bed at one end thereof, passing a fluidizing gas upwardly through the bottom of the bed at a flow velocity by at least one order of magnitude greater than the velocity of fluidization, and causing said fluidizing medium to pass upwardly through the bottom of the bed through orifices that open and close at a frequency that varies inversely as the flow resistance above each individual orifice, and continuously removing the fluidized particulate material at the opposite end of the fluidized bed.

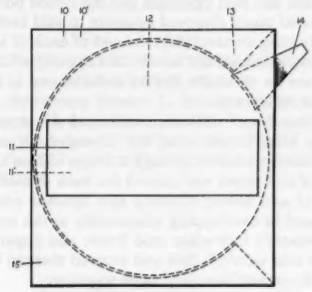


4,107,852

MEMORIZATION AIDS

Robert D. Epstein, 7 Tanglewood Rd., West Hartford, Conn. 06117

Filed Jan. 4, 1977, Ser. No. 756,621
Int. Cl.[2] G09B *19/00*
U.S. Cl. 35—8 R **3 Claims**



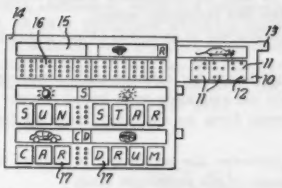
1. A memorization device that is manually operable, comprising: a top plate member with an opening cut therein; two linear polarizers comprising a first linear polarizer fixed beneath said plate member such that it obstructs said opening and a second linear polarizer which is circular in form; and a frame for said second polarizer such that the frame is fixed beneath the first plate member and such that said second polarizer is free to rotate within that frame and such that said polarizer obstructs the opening cut in the top plate member; a bottom plate member fixed beneath the frame of the second linear polarizer, said plate member having an opening cut therein that coincides with the opening in the top plate member; a means for rotating the second linear polarizer through at least a ninety degree angle with respect to the first linear polarizer comprising a lever attached to the second linear polarizer and protruding from a cutaway section of the frame of the second linear polarizer.

4,107,853

EDUCATIONAL TOYS

Peter Henry Cook, 39 Romer Ave., Lewisham, London, S.E. 13, England , and Joseph Arthur Henry Holmes, London, England, assignors to B & H Commercial Inventors & Designers Limited and Peter Henry Cook, both of London, England

Filed Feb. 25, 1977, Ser. No. 772,093
Claims priority, application United Kingdom, Mar. 9, 1976, 9390/76; Jul. 12, 1976, 28962/76
Int. Cl.[2] G09B *1/10*
U.S. Cl. 35—35 H **16 Claims**



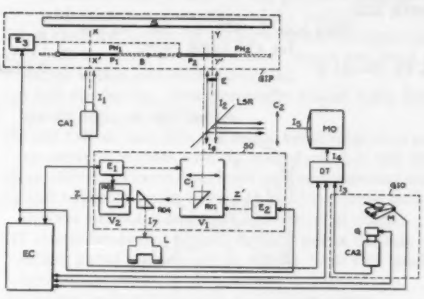
1. An educational toy comprising support means arranged or arrangeable to define a plurality of adjacent stations, a supply of elements each bearing at least one character, from which elements the solution of a problem represented by the stations can be built up by placement of the element on respective stations, and co-operating means on the stations and elements for verifying that a correct element is mounted on any station, said supply of elements divided into a plurality of groups each having a distinctive visible coding which is not associated with any said problem or its solution and said stations each bear the appropriate group coding, whereby an appropriate element can be chosen from a predetermined number of possibilities corresponding to the number of different elements in its group.

4,107,854

TRAINING SYSTEM FOR SIMULATING AN ANIMATED SCENE

Pierre Paul André Bougon, Elancourt, France, assignor to Le Materiel Telephonique, Boulogne-Billancourt, France

Filed Apr. 19, 1977, Ser. No. 788,783
Claims priority, application France, Apr. 23, 1976, 7612043
Int. Cl.[2] G09B *9/00*
U.S. Cl. 35—25 **4 Claims**



1. An animated scene simulation system of the type wherein the image of an object is inserted electronically into an animation zone image which, in turn, is added optically into a landscape image, which comprises:

means for generating first and second substantially similar landscape images;

means for inducing displacements of said images in their respective planes, each of these displacements being de-

fined with respect to a given fixed mean axis perpendicular to the translation plane of the corresponding image;

an image converter, the optical axis of which is coincident with the means axis of the first landscape image and which produces an image of the animation zone;

an opaque screen the outline of which is similar to that of said animation zone and which is positioned opposite the second landscape image in registration with the mean axis of said second landscape image thereby to form an environmental image similar to the second landscape image but possessing a zero-brightness zone similar in outline and position in said environmental image to the animation zone in the first landscape image;

means for producing an animated object image in electronic form;

a processing device for electronically inserting the object image into the animation zone image thereby to produce in electronic form an animated image of the animation zone;

an image converter for producing in optical form an animated image of the animation zone;

means for producing, by the optical addition of the animated image of the animation zone and the environmental image, in correspondence with the zero-brightness zone, a moving image of the animated landscape, the displacement of said moving image being substantially similar to that of the second landscape image;

an optical compensation device for producing from the moving animated landscape image an animated landscape image observable in a viewfinder fixed with respect to an observer; and

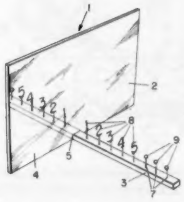
control means for coordinating the operation of the object producing means, displacement inducing means and moving image producing means.

4,107,855

TEACHING AID FOR MATHEMATICS

George Ropchan, 95 Willowridge, Weston, Ontario, Canada (M9R 3Z5)

Filed May 2, 1977, Ser. No. 792,769
Int. Cl.[2] G09B *19/02*
U.S. Cl. 35—31 R **5 Claims**



1. A teaching aid for mathematics comprising a mirror surface, arm means extending at right angles from said surface, spaced peg means vertically arranged on said arm means, integer means sequentially disposed on said peg means whereby said integer means will be viewable from the front and represent positive integers and their images will be reflected in said mirror surface and will represent negative integers.

4,107,856

FAST CLOSING ATHLETIC BOOT

Rene Bourque, Laval, Canada, assignor to The Garcia Corporation, Teaneck, N.J.

Continuation of Ser. No. 735,520, Oct. 26, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,809
Claims priority, application Canada, Sep. 13, 1976, 261092
Int. Cl.[2] A43B *5/04, 11/00;* A63C *3/02*
U.S. Cl. 36—115 **14 Claims**

1. A molded athletic boot comprising:

a lower shaped to substantially encase the toe, sides and heel of the wearer's foot, said lower including an upward extension on each side thereof, and an upward extension from the heel area;

a generally U-shaped upper;

means connecting said upper and lower for limited relative rotation, said upper being arranged with its open sides adjacent said heel extension and the closed portion of said U-shaped upper disposed opposite to said heel extension;

a flexible strap connected to the end of each of said upward side extensions of said lower, said upper provided with an aperture on each side thereof dimensioned to receive one of said straps; and

connecting means associated with said straps, each of said straps being constructed and arranged to pass from its associated extension through the aperture on the opposite side of said upper and around the back of said heel extension of said lower whereby said upward extensions are disposed in overlapping relationship at the instep area of the wearer's foot when said lower and upper are closed about said wearer's foot and secured thereon by drawing said straps and fastening same together.

4,107,857

ATHLETIC SHOE CONSTRUCTION

Gerard P. Devlin, 1028 Adams Ave., Franklin Square, N.Y. 11010

Filed Apr. 11, 1977, Ser. No. 786,176
Int. Cl.[2] A43B *5/00, 3/12, 23/26;* A43C *15/00*
U.S. Cl. 36—129 **13 Claims**

11. An athletic shoe comprising:

a sole having toe, ball, arch, and heel sections, corresponding to the toe, ball, arch, and heel of a foot;

an upper including a toe cup secured generally to the periphery of said sole adjacent to said toe section thereof, a tongue secured to said top cup and extending generally rearwardly therefrom toward said heel section of said sole, and a heel cup secured generally to the periphery of the sole adjacent to said heel section of said sole, said upper also having three holes formed therethrough adjacent to said toe section of said sole;

a removable spike assembly, said spike assembly including at least one spike mount means embedded in said sole, adjacent to said toe section thereof, said spike mount means having at least one hole formed therethrough, which facilitates embedding and positive securement of said spike mount means in said sole, said spike mount means having at least three vertically-extending bores formed therethrough, at least three removable spikes, each of which has an upper portion which is insertable within one of said bores of said spike mount means, and which has formed therein an upwardly-opening, axially-extending, internally-threaded bore, and at least three removble screws, each of which has an expanded head portion, and

which is insertable in one of the bores of said spike mount means with said head thereof abutting said spike mount means, and which is threadably receivable within said bore of one of said spikes to effect locking engagement of said spikes

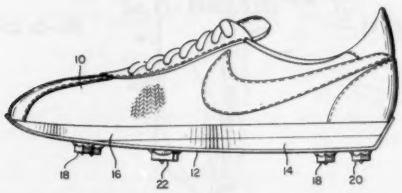
to said sole in a rigid and fixed, non-displaceable position, said holes in said upper each being vertically-aligned with one of the bores of said spike mount means to permit access to said screws received therein, and said spikes each having a radially, outwardly-extending annular collar which abuts the bottom of said sole, when said spikes are fully inserted in said spike mount means, said spikes, each having an arcuately-curved, forward portion, and a flat, rearward portion below said collar thereof.

4,107,858

ATHLETIC SHOE HAVING LATERALLY ELONGATED METATARSAL CLEAT

William J. Bowerman; Stanley L. James, and Dennis E. Vixie, all of Eugene, Oreg., assignors to BRS, Inc., Beaverton, Oreg.

Filed Apr. 15, 1977, Ser. No. 787,888
Int. Cl.[2] A43B *5/00, 13/04;* A43C *15/00*
U.S. Cl. 36—134 **17 Claims**



1. An athletic shoe in which the improvement comprises:

an outer sole having a plurality of spaced cleats of resilient material molded integral with said outer sole under the toe and heel portions of the shoe;

said cleats including an elongated lateral cleat extending laterally across substantially the entire width of the toe portion of said sole;

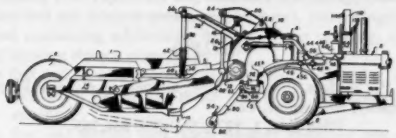
said cleats each having a substantially flat ground engaging bottom surface and including a plurality of other toe cleats of smaller ground engaging surface area than said lateral cleat, said other toe cleats being positioned in front of said lateral cleat, substantially the same height as said lateral cleat, and spaced from each other laterally across the width of said sole.

4,107,859

DEPTH INDICATING AND DEPTH CONTROLLING DEVICES FOR EARTH MOVING MACHINES

Wayland D. Keith, P.O. Box 2446, Wichita Falls, Tex. 76307

Continuation of Ser. No. 560,260, Mar. 20, 1975, abandoned, which is a continuation of Ser. No. 457,658, Apr. 4, 1974, abandoned, which is a continuation of Ser. No. 364,331, May 29, 1973, abandoned, which is a continuation of Ser. No. 256,618, May 24, 1972, abandoned, which is a continuation of Ser. No. 59,371, Jul. 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 813,778, Jun. 26, 1969, abandoned, which is a continuation-in-part of Ser. No. 504,380, Oct. 24, 1965, abandoned. This application Dec. 24, 1975, Ser. No. 644,165
Int. Cl.[2] E02F *3/62*
U.S. Cl. 37—126 A **1 Claim**



1. An attachment for an earth moving machine having a ground engaging blade and a hydraulic system for raising and lowering the ground engaging blade, which attachment comprises:

(a) a first electrical circuit,

(b) a first selsyn motor mounted on the earth moving machine and being connected within said first electrical circuit, which selsyn motor is capable of receiving electromagnetic impulses,

(c) a selsyn generator connected with said first electrical circuit, which selsyn generator is capable of generating electro-magnetic impulses to be transmitted to a receiving motor for synchronous rotation therewith,

(d) an indicator means connected with the shaft of said first selsyn motor,

(1) a dial surrounding said shaft and being readable with respect to said indicator means,

(2) circumferentially spaced indicia on said dial of said indicator means to indicate the relative position of said first selsyn motor with respect to said selsyn generator to indicate the position of the ground engaging blade with respect to the surface of the terrain,

(e) an electrical circuit associated with said indicator means,

(f) a bulb mounted on said indicator means and being connected within said electrical circuit,

(g) said dial having circumferentially spaced holes formed therein adjacent said indicia,

(h) said bulb on said indicator means being adapted to swing arcuately in register with the holes formed in said dial,

(i) an electrical circuit associated with said indicator means,

(j) said indicator means having an electrical brush mounted thereon and connected with said electrical circuit,

(k) circumferentially spaced contact points on said dial, which points are adapted to register with said brush on said indicator means when moved arcuately,

(l) circuits leading from each said contact points,

(m) a double throw limit switch associated with each of said circuits leading from said contact points,

(n) an electrically controlled valve associated with the hydraulic system to control the flow of hydraulic fluid therein to move the ground engaging blade with respect to the surface of the terrain,

(o) said electrically controlled valve having two circuits leading thereto for movement of the valve to different positions,

(p) a switch contact on opposite sides of each said double throw limit switch,

(q) a circuit leading from each contact on one side of each said limit switch to said electrically controlled valve,

(r) a second set of electrical contacts leading from the other of said contacts of said double throw limit switches, which contacts lead to another circuit associated with said electrically controlled valve so as to move the valve in the opposite direction from the movement accorded by the first mentioned circuit,

(1) a source of electricity,

(2) the other side of each circuit leading from said electrically controlled valve being connected with said source of electricity, and

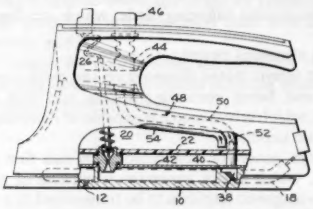
(s) said limit switches actuating said electrically controlled valve to admit fluid therethrough in one direction or to direct fluid therethrough in the opposite direction, in accordance with the setting of said limit switches, to maintain the ground engaging blade within certain limits with respect to the terrain.

4,107,860

STEAM IRON

James P. Coggiola, Pomona, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed Dec. 1, 1977, Ser. No. 856,265
Int. Cl.[2] D06F *75/06*
U.S. Cl. 38—77.83 **5 Claims**



1. In a steam iron with a handle and fill opening to a water tank above an electrically heated soleplate and having steam generator means positioned in the lower rear portion of the iron and steam ports in the soleplate, a handle mounted pump connected to the generator to rapidly force a volume of water to the generator for a surge of steam to the ports, the improvement comprising,

said pump being disposed in the upper forward portion of the handle and completely external of said tank,

a double conduit tubular means connected to said pump at one end,

one conduit extending through said tank and terminating at the generator and

the other conduit terminating adjacent said generator in said tank rear portion, at the other end of said double conduit,

said double conduit extending from said upper forward handle portion substantially slanted down to said generator and tank rear for surge generation in horizontal and vertical positions.

4,107,861

LABEL STRUCTURE

Kenneth M. Johnson, Chicago, Ill., assignor to Packaging Laminators, Inc., Bensenville, Ill.

Filed Apr. 26, 1976, Ser. No. 680,381
Int. Cl.[2] A44C *3/00*
U.S. Cl. 40—2 R **23 Claims**

1. A label structure comprising

a sheet member having generally spaced parallel faces said sheet member having, a thickness ranging from about 0.1 to 100 mils and comprised of an oriented thermoplastic polymer which is translucent as respects transmitted daylight,

a substrate member in a sheet-like form having a generally smooth surface, said surface being adjacent one face of said sheet member,

bonding means joining said sheet member and said substrate member together in fixed adjacent relationship relative to one another,

at least one of said substrate member, and said bonding means having a contrasting color relative to said sheet member, and

fastening means engaging said label structure for securing said label structure to a body spatially proximate to said label structure;

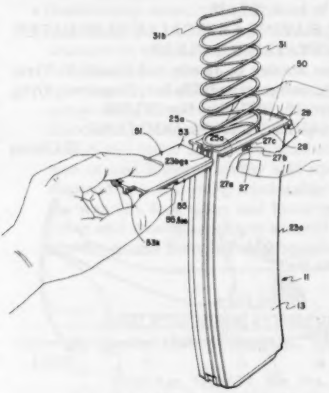
said label structure being capable of having information recorded therein by impressing indicia onto a face of said sheet member without mechanical distortion of said label structure so as to record said indicia into said label structure permanently during a normal life cycle of said label structure by causing localized indicia-impressed areas of said sheet member to become more light-transmissive than unimpressed adjacent sheet member areas.

4,107,862

CARTRIDGE MAGAZINE

Jacob Sofinowski, III, Baldwin, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Nov. 16, 1976, Ser. No. 742,304
Int. Cl.[2] F41C *25/02*
U.S. Cl. 42—50 **5 Claims**



1. A cartridge magazine comprising

a main body having a cartridge receiving and holding chamber formed therein and open at two opposite ends, one of said open ends forming a cartridge entry and exit feed opening, and the other of said open ends forming a feed spring and feed plate assembly opening,

a cartridge feed member slidable in feeding relation within said chamber,

a cover removably secured to said main body in a position over said spring and feed plate assembly opening,

and a compression feed spring disposed within said chamber

and extending in compression biasing relation between said cover and said feed plate,

said cover being laterally slidably removable from said main body,

said main body having outwardly oppositely extending slide/retention rails formed at opposite sides of said feed spring and feed plate assembly opening,

said cover having inturned slide/retention lips with associated slide/retention grooves slidably engagable with said rails for slidably removable retention of said cover over said feed spring and feed plate assembly opening,

lock stop means formed on at least one outer side wall of said main body adjacent at least one of said rails,

and lock lip means formed on at least one of said slide/retention lips and engagable with said lock stop means to lock said cover in place,

said one outer side wall being manually elastically flexible to an extent to enable depression of said lock stop means to a laterally inward position out of locking relation with said lock lip means,

said lock stop means being cam lock stop means having a cam entry portion engagable by said lock lip means to enable ease of slide locking of said cover into place on said rails, and a shoulder lock stop retention portion to lock said lock lip means in place after sliding over said cam entry portion,

said lock stop means and said lock lip means comprising respective lock stop means and lock lip means on opposite respective sides of said main body and said cover, and both associated outer side walls of said main cover being manually elastically flexible to an extent to enable depression of the respective said lock stop means to a laterally inward position out of locking relation with the respective said lock stop means,

a central lateral spring biasing and constraining key tab formed on said cover and engagable in lateral biasing and displacing relation with said spring as a function of slide-on assembly and locking of said cover into place on said rails,

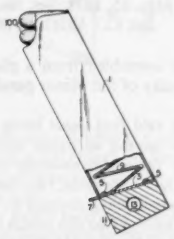
and a key tab slot formed in an associated end wall of said main body for passage therethrough of said key tab during assembly and disassembly movement of said cover along said rails.

4,107,863

MAGAZINE ENGAGEMENT MEANS

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed May 5, 1977, Ser. No. 794,102
Int. Cl.² F41C *25/02*
U.S. Cl. 42—50 **15 Claims**



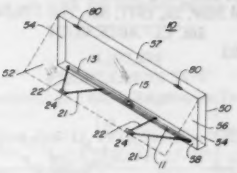
1. In a cartridge magazine including a casing and a floor: a member affixed to said magazine and extending a substantial distance below said floor, said member comprising an extension of said casing; and at least one hole in said member adapted for releaseable engagement with a supporting structure whereby said magazine can be supported in an extended manner.

4,107,864

SIGN OPENING, CLOSING AND LOCKING DEVICE

Donald W. Brown, 218 E. Curling Dr., Boise, Id. 83702

Filed Feb. 22, 1977, Ser. No. 770,857
Int. Cl.² G09F *7/00*
U.S. Cl. 40—601 **2 Claims**



1. In a sign having a substantially rectangular, boxlike, frame including two oppositely disposed side panels, oppositely disposed top and bottom panels, a back panel, and a hinged front panel containing advertising indicia, a sign opening, closing, and locking device comprising:

a first and second raceway longitudinally secured to the top surface of the bottom panel, said raceways parallel to one another;

a first and second rack, each slidably engaging one of said raceways;

a pinion rotatably engaging each of said racks for moving said racks in opposite directions to one another upon rotation of said pinion;

a first pin securedly attached to the front panel;

a second pin securedly attached to the bottom panel;

a first and second lever pivotally connecting said first and second rack, respectively to a lower portion of the front panel at a common pivoting juncture, and each lever defining and its end a slot and an adjacent hook, said slots slidably engaging said first pin and said hooks operable to lockingly engage said second pin when the sign opening and closing device is in the closed position; and

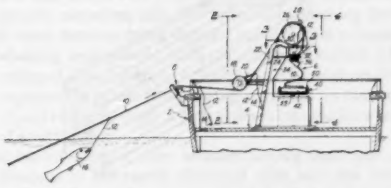
a pair of springs, each of said springs connecting one of said levers to said first pin for moving the slot relative to said first pin.

4,107,865

LONG LINE COILING APPARATUS

Wayne E. Alex, Box 95, Juneau, Ak. 99802

Filed Jan. 28, 1977, Ser. No. 763,620
Int. Cl.² A01K *91/00*
U.S. Cl. 43—27.4 **4 Claims**



1. A long line hauling and coiling apparatus for long lines having spaced gangions and hooks thereon, comprising:

a power driven line hauling wheel;

a rotatable line coiler device adjacent said wheel and guide means for directing a line from said wheel to said coiler device;

chute means adjacent said wheel for directing gangions and hooks secured to said line to said guide means;

a conveyor belt arranged to receive coils of line from said coiler device; and

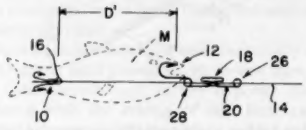
drive means for moving said conveyor belt at a selected

speed whereby said line is deposited on said belt in successively displaced loops with said hooks lying within said loops.

4,107,866
KNOTLESS MINNOW RIG

Joseph T. Manno, Star Rte., Kane, Pa. 16735

Filed Mar. 21, 1977, Ser. No. 779,547
Int. Cl.[2] A01K *91/04*
U.S. Cl. 43—44.83 **8 Claims**

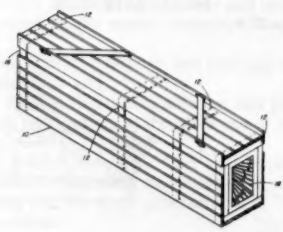


1. A minnow rig comprising
a first hook adapted to be disposed in a tail portion of a live minnow,
a second hook adapted to be disposed in a head portion of a live minnow,
a single line,
a portion of said first hook for connection to a free end of said line, and
means integrally connected to said second hook for effecting connection of said single line to said second hook by friction wrapping for holding said second hook in a predetermined fixed relative position with respect to said first hook along said line, said means consisting of at least a first surface manifestation for receiving said line, formed on one side of a generally T-shaped projection; said at least one surface manifestation and said projection disposed in-line, substantially parallel to the direction said line takes when connected up to said hooks; and said surface manifestation and said projection being spaced a fixed predetermined distance apart.

4,107,867
CATFISH TRAP

Benton B. Kennedy, Gen Delivery, Allemand, La. 70030

Continuation-in-part of Ser. No. 622,928, Oct. 16, 1975, abandoned. This application May 31, 1977, Ser. No. 802,220
Int. Cl.[2] A01K *69/06*
U.S. Cl. 43—65 **1 Claim**

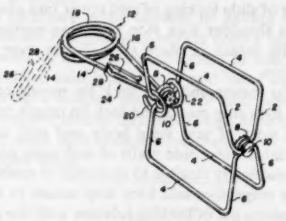


1. A catfish trap for catching catfish only of a desired size and comprising:
a. an elongated box defined by spaced apart slats, and having an open end for the entrance of fish therein;
b. an outer passageway converging inwardly from said open end to a round exit sized to lightly engage the desired size catfish at their respective largest transverse dimensions, said outer passageway being defined by short tapered plastic splines mounted around said open end and opposed in length to define closed sides; and
c. an inner passageway converging to relatively smaller round second exit having a diameter of the same size as the spacing between slats, and defined by longer tapered and thus more flexible plastic splines than those of said outer passageway mounted in said elongated box and spaced inwardly from said exit of said outer passageway a distance less than the average length of the desired size of catfish, said inner passageway being easily expandable by said catfish by its passage therethrough into a fish retaining part of said slatted box, but not out, whereby only catfish sized to lightly touch the exit of said outer passageway are finally trapped and all the other fish of the same size and all larger fish do not enter the box, and smaller fish swim out.

4,107,868
ACTUATOR

Frank Conibear, and Peter Verstraaten, both of Victoria, Canada, assignors to Woodstream Corporation, Lititz, Pa.

Filed Jan. 31, 1977, Ser. No. 764,352
Claims priority, application Canada, Jul. 12, 1976, 267353
Int. Cl.[2] A01M *23/26*
U.S. Cl. 43—88 **4 Claims**



1. In an actuator for a rotating frame animal trap having two similar frames pivotaly connected to each other, the actuator comprising two arms spring biased at one end and each terminating in a ring at the other, the rings having the dimensions so that the actuator can be mounted on the trap to encircle adjacent ends of both frames of the trap, whereby on release of the trap, the actuator can rapidly and forcefully effect a rotation of the trap to its closed position, the improvement comprising a rigid joint formed in one arm of the actuator, said joint being breakable to separate the one arm by application of a force to the spring biased end of the actuator.

4,107,869
DEMOUNTABLE TOY HOUSE

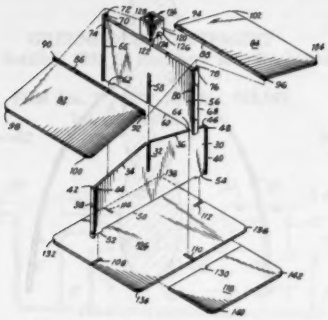
D. David Abrams, Kowloon, Hong Kong, assignor to Mego Corp., New York, N.Y.

Filed Mar. 15, 1977, Ser. No. 777,850
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—21 **8 Claims**

1. A toy house assembled from a plurality of panels and comprising a plurality of flat planar panels, said panels including
(a) a first panel, said first panel being a vertically oriented interior panel having an upper vertical slot, two upper edges which slope downwardly away from the open upper end of said upper slot, two vertical side edges, each of said side edges being defined by a vertical strip, each vertical strip having two lips which extend transversely to a side edge of said first panel, and a lower horizontal edge having a terminal vertical extension at each end thereof;
(b) a second panel, said second panel being a generally rectangular vertically oriented interior panel having a lower vertical slot, said lower slot extending upwards from the lower horizontal edge of said second panel, so that when the toy house is assembled, said first and second panels are substantially perpendicular to each other with each of said first and second panels fitting into the respective slot of

the other panel, the lower horizontal edge of said second panel having a terminal vertical extension at each end thereof, and two vertical side edges, each of said side edges being defined by a vertical strip, each vertical strip having an upper recess and two lips which extend transversely to a side edge of said second panel;

(c) a third and fourth panels, said third and fourth panels being generally rectangular roof panels, each of said third and fourth panels having a horizontal lip which extends transversely to the top edge of the respective associated



panel, each lip projecting outwards from a corner of said associated panel so that each lip extends into one of said upper recesses in a vertical strip of a said second panel when the toy house is assembled; and

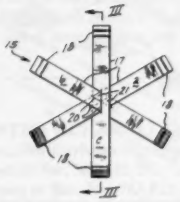
(d) a fifth panel, said fifth panel being a generally rectangular horizontal floor panel, each edge of said fifth panel having a slot which extends inwards from the periphery of said fifth panel, so that each terminal vertical extension of said first and second panels extends into a slot when the toy house is assembled.

4,107,870

SEPARABLE CONNECTIVE FLEXIBLE TOY ASSEMBLY

Steven Ausnit, 124 E. 61st St., New York, N.Y. 10021

Filed Sep. 13, 1976, Ser. No. 722,722
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—28 **17 Claims**



1. A separably connective flexible toy, comprising:

a plurality of generally flat elongated flexible strips, each of which has complementary rib and groove fastener means at each opposite end;

each of said strips being bendable and twistable along its length, and said fastener ribs and grooves being interlockable with fastener ribs and grooves at the opposite end of the same strip or of another such strip; and

at least one of said strips having a slit therein through which a second of said strips projects for retained generally crossing assembled relation with the slit strip.

13. A method of making a separably connective flexible toy, comprising:

manipulating a plurality of generally flat elongated flexible toy strips which are bendable and twistable along their length and each having at opposite ends thereof complementary rib and groove fastener means; and

projecting at least one of the strips through a slit in at least a second of the strips and thereby assembling the strips into a generally crossing multi-arm relationship;

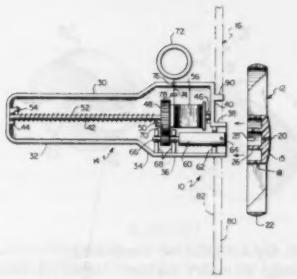
whereby the strip arms may be bent for interlocking the fastener ribs and grooves at the ends of the same strip with one another or with the fastener means of another strip.

4,107,871

PROPULSION TOY

James R. Hornsby, Jr., 6239 Edgewater Dr., Orlando, Fla. 32810

Filed Jan. 12, 1977, Ser. No. 758,782
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—83 **4 Claims**



1. A propulsion toy amusement device comprising the combination of:

a launchable rotor member;

a launching device; and

an enlarged disc removably disposed between said rotor member and said launching device;

said rotor member including a central portion, a rim concentrically surrounding said central portion and blade members interconnecting said central portion and said rim;

said launching device including a housing having a forward end portion, a rotatable body within said housing extending at least partially within said forward end, and a digitally operable launching element for rapidly rotating said rotatable body;

said enlarged disc having a central aperture therein configured for reception of said housing forward end portion and into which said housing forward end portion extend thereby mounting said disc upon said launching device;

said rotor member being initially positioned in substantially abutting engagement with the forward surface of said enlarged disc and being retained in such initial position by engagement of said rotor central portion with that portion of said rotatable body which extends into the forward end of said housing;

said blades on said rotor member having their rear edges disposed in substantial abutment with said disc forward surface when said rotor member is in its initial position;

said rotor member being launched by digitial operation of said launch element which sets said rotatable body and engaged rotor member into rapid rotation whereby air pressure exerted by said rotating blade members is directed against said disc to cause said rotor member to disengage from said rotatable body and to be propelled forwardly in space while spinning rapidly;

said disc having a diameter substantially greater than the diameter of said rotor member to thereby shield and secret the launching device from the view of an observer in front of said amusement device in order to prevent such observer from seeing the launching operation;

said central aperture and said housing forward end portion being non-circular;

said disc including a guide hole formed therein adjacent to said central aperture and said housing having a forwardly projecting pin which extends through said guide hole, said disc thereby being removably secured to said housing in a manner which prevents said disc from rotating relative to said housing.

4,107,872

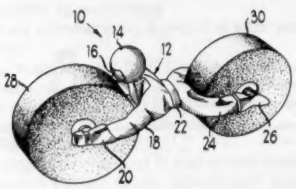
ACTION TOY FOR LAND AND WATER

James E. Tucker, Oak Park; Joseph M. Burck, Chicago, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 4, 1977, Ser. No. 821,702

Int. Cl.[2] A63H *11/10*

U.S. Cl. 46—103 **10 Claims**



1. An action toy for children comprising:

a body having an outer surface shaped to resemble the human form in a generally horizontal position as in riding the surf;

said body including a pair of forwardly extending spaced apart arms and a pair of rearwardly extending spaced apart legs forming spaced apart recesses at opposite ends of said body;

a pair of relatively large cylindrical wheels mounted in said recesses formed of deformable, lightweight flotation material and mounted for rotation on a pair of spaced apart axes extending transversely between opposite outer end portions of said arms and legs, respectively; and

means for rotatively driving at least one of said wheels to propel said toy across a supporting surface.

4,107,873

STUFFED REVERSIBLE DOLL

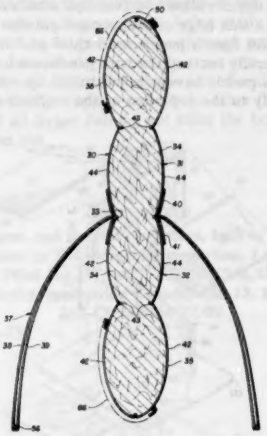
Adeline L. Bauer, Rte. 1, Trempealeau, Wis. 54661

Filed Dec. 3, 1976, Ser. No. 747,062

Int. Cl.[2] A63H *3/12*

U.S. Cl. 46—153 **2 Claims**

1. A stuffed reversible doll comprising a stuffed body which is unitary and includes oppositely longitudinally extending body sections having the stuffing contained within fabric covering to form individual doll figures joined at a common waist, said fabric coverings for said individual doll figures being of different fabric patterns and forming the stuffing envelope of said unitary stuffed body, a reversible skirt attached to the stuffed body at said common waist and adapted to conceal one doll figure while exposing the other doll figure to view in each of two positions of use, said skirt formed in two fabric plies and each ply having a different fabric pattern, the fabric pattern of one skirt ply matching the permanently attached fabric covering on one doll figure and the fabric pattern of the other skirt ply matching the permanently attached fabric covering on the other doll figure, said reversible skirt in either of its two positions of use coacting with one of said permanently attached fabric coverings on said doll figures to present the appearance of a full length dress on such figure having one fabric pattern, each ply of the two ply reversible skirt having a waist extension thereon overlapping and surrounding a comparatively narrow surface area of one doll figure immediately adjacent to and on one side of the common waist, and a pair of independent decorative waistbands overlying and surrounding said waist extensions of the skirt plies and substantially concealing the



waist extensions and being attached therewith to said stuffed body, said waist extensions and their associated waistbands conforming to the shape of the doll at the waist areas of the individual doll figures.

4,107,874

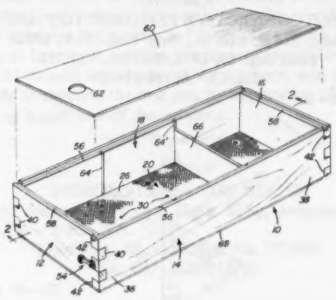
SPROUTER

David A. Richardson, 2506 Southland Dr., Austin, Tex. 78704

Filed Jan. 28, 1977, Ser. No. 763,596

Int. Cl.[2] A01C *1/02*

U.S. Cl. 47—14 **6 Claims**



1. A sprouter, comprising, in combination:

(a) wall means for defining the lateral extent of a growing chamber of the sprouter; and

(b) a base connected to the wall means for forming a bottom of the growing chamber, the base including means for retaining a quantity of water and supplying sprouts in the growing chamber for a predetermined length of time, the base having a periphery, and the wall means including at least one wall forming a continuous surface around the periphery of the base, the wall means including a plurality of substantially planar walls pivotally connected together, each of the walls having edges defining a finite thickness and two spaced ends perpendicular to the edges, the ends of each of the walls being notched in alternate sequence to one another for interengaging with an end of an adjacent one of the walls, at least some of the walls being provided with holes extending perpendicularly to the edges and

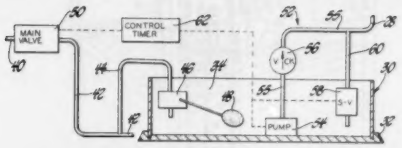
disposed at the notched ends of the walls, each of the holes being offset from a center of the finite thickness of the associated one of the walls, and pins inserted in the holes for pivotally joining the associated walls to one another, the offset of the holes locating the pins eccentrically with respect to the resulting joint for spacing the ends of the walls from one another when an included angle between the adjoining walls is increased and facilitating cleaning of the ends of the walls without removing the pins from the associated holes.

4,107,875

GREENHOUSE EQUIPMENT

Darrell E. Bordine, 1835 S. Rochester Rd., Rochester, Mich. 48063

Filed Jan. 27, 1977, Ser. No. 763,057
Int. Cl.² A01G *31/00*
U.S. Cl. 47—62 **9 Claims**



1. An assembly for supplying a nutrient solution to plants comprising: a greenhouse bench for supporting plants and retaining the solution; reservoir means for storing the solution for said bench; source means for providing a source of solution for said reservoir means; control means for automatically controlling the flow of solution from said source means to said reservoir means and for periodically effecting the flow of solution from said reservoir means to said bench to flood said bench; said control means including supply line means establishing communication for said solution between said source means and said reservoir means, supply valve means in said supply line means for controlling the flow of solution therethrough in response to the amount of solution in said reservoir means to maintain a predetermined amount of solution in said reservoir means, main valve means having open and closed positions for controlling the flow of solution from said source means to said supply line means, flood-drain means for flooding said bench with solution from said reservoir and draining solution from said bench into said reservoir, and timing means for actuating said flood-drain means to flood said bench and for closing said main valve means while said flood-drain means is actuated.

4,107,876

INVERTED V CHANNEL CULTURE

George Greenbaum, 790 Boylston St., Boston, Mass. 02199

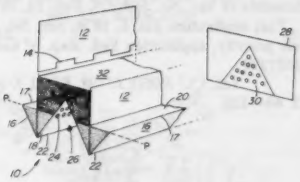
Continuation-in-part of Ser. No. 842,292, Oct. 14, 1977, which is a continuation-in-part of Ser. No. 763,821, Jan. 31, 1977, which is a continuation-in-part of Ser. No. 684,465, May 7, 1976, Pat. No. 4,014,135. This application Feb. 27, 1978, Ser. No. 881,586
Int. Cl.² A01G *9/02*
U.S. Cl. 47—79 **33 Claims**

1. A planter for growing plants which comprises:

an inverted V-shaped floor having lower edges and an upper surface and a lower surface;

outer walls on either side of the floor combined to the lower edges and defining a reservoir therebetween at least a portion thereof adapted to hold a hydrophilic fill material;

inner walls having lower portions and upper portions, said lower portions received in the reservoir between the outer walls and floor and being fluid permeable, the upper portions defining with the floor a cavity to hold soil, the cavity and reservoir in fluid flow communication whereby when liquid is added to the soil, the configuration of the V-shaped floor will enhance the drainage through the lower portion of the inner wall, said liquid being absorbed by the hydrophilic fill, which fill will tend



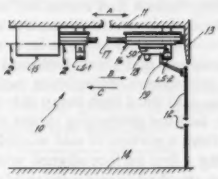
to transmit the liquid back to the soil as the soil loses its moisture.

4,107,877

GARAGE DOOR OPERATOR AND DOOR OBSTRUCTION SENSING APPARATUS

Maw Huei Lee, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio

Filed Sep. 19, 1977, Ser. No. 834,410
Int. Cl.² E05F *15/10*
U.S. Cl. 49—28 **35 Claims**



1. In a screw-driven garage door operator having a motor for rotating a screw and an operator control means for controlling said operator to selectively raise and lower a door, improved means for sensing a door obstruction and for controlling said operator in response to sensing said obstruction including:

a screw in said operator, said screw connected to said door for raising and lowering said door upon rotation of said screw, and said screw being movable in a longitudinal direction parallel to a longitudinal axis of said screw, whereby when said door strikes an obstacle, said screw, upon continued rotation, is moved in said longitudinal direction at least a predetermined distance,

at least one control switch operatively connected to said operator control means, and

control switch actuating means comprising a lever arm pivoted at one end to said operator on one side of said longitudinal axis, said lever arm connected intermediate its ends to said screw, and said lever arm having another end disposed in cooperative relationship with said control switch for actuating said control switch when said screw moves in said longitudinal direction over said predetermined distance.

4,107,878
LATERAL CONNECTION MEMBER OF A PARTITION FOR A BATHING- OR SHOWER-CABIN

Heinz Georg Baus, Ulmenweg 46, Thun, Switzerland (CH-3601)

Continuation of Ser. No. 549,025, Feb. 11, 1975, abandoned.
This application Jul. 6, 1976, Ser. No. 702,665
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407230
Int. Cl.[2] E05D *15/08;* E06B *3/46*
U.S. Cl. 49—125 3 Claims

1. Partition apparatus of a bathing or shower cabin, comprising at least one slideable partition; horizontal rail means for guiding sliding of said at least one partition; vertical U-shaped frame members comprising a crosspiece having first and second sides thereof opposite each other, said crosspiece comprising a first and a second projecting limb projecting from said first side and spaced apart so as to define between said first and second projecting limbs a first recess for receiving a terminal portion of said rail means, said crosspiece comprising a third projecting limb, which limb projects from said second side so as to define between said third limb and said crosspiece a second recess, said second recess being capable of receiving a further partition, said third limb being able to be attached to a barrier surface; and the projecting means engageable with or disengageable from a portion of said second side of said crosspiece and having a first surface aligned with the second limb, a second surface attached to said portion of said crosspiece and a third surface being able to be attached to said barrier surface, said portion being located so that projecting means will be spaced apart from said third limb.

4,107,879
DOOR OF THE SELF-LOCKING TYPE

Franz Steimann, Gelsenkirchen-Horst, Germany, assignor to Didier Engineering GmbH., Essen, Germany
Germany

Filed Jul. 21, 1977, Ser. No. 818,100
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 7623290[U]
Int. Cl.[2] E05C *21/02*
U.S. Cl. 49—465 7 Claims

1. A door of the type wherein the weight of the door causes locking thereof against a door frame of the type having extending outwardly therefrom vertically spaced pairs of support hooks for supporting the door, said door comprising:

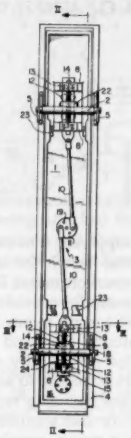
a door element adapted to be sealed against a door frame and close a door opening therein;

a pair of vertically spaced, horizontally extending locking bars carried by said door element, each said locking bar having opposite round ends adapted to rest on and be held by a respective pair of support hooks of the door frame;

a pair of locking support members, one each associated with a respective one of said locking bars, said locking support members being mounted for vertical sliding movement along said door element, each said locking support member having therein an elongated vertically extending slot;

means for pivotally connecting each said locking bar to the respective said locking support member about a respective horizontal axis, such that upon positioning said locking bars on the respective support hooks, the weight of the door will cause said locking bars to pivot about the respective said pivot axes in directions away from said door element, thereby pressing said door in a direction away from the hooks and toward the door frame;

equalizer linkage means, rotatably mounted on said door element and connected to both of said locking support members, for equalizing the relative positions of said



locking bars with respect to the hooks upon initial positioning thereon of said locking bars, by allowing relative movement of said locking support members along said door element in vertical directions toward or away from each other;

a pair of vertically extending rails attached to said door element, one each of said rails extending into a respective one of said slots; and

means for guiding the vertical movement of said locking support members, said guiding means comprising first rollers mounted on said locking support members for rotation about axes extending parallel to said door element and second rollers mounted on said locking support members for rotation about axes perpendicular to said door element, said second rollers contacting and rolling on said rails.

4,107,880
FLOATING BUFFING WHEEL ASSEMBLY

John P. Randall, W153 N5264 Plaza Dr., Menomonee Falls, Wis. 53051

Filed Feb. 2, 1976, Ser. No. 654,064
Int. Cl.[2] B24B *5/18*
U.S. Cl. 51—103 TF 10 Claims

1. A buffing wheel assembly comprising:

a main frame,

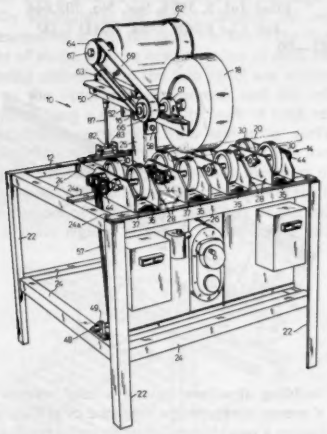
means on said frame for transporting a workpiece across the frame,

a buffing wheel having a flat cylindrical buffing surface,

means on said frame for supporting the buffing surface on said buffing wheel in a position to engage the surface of the workpiece as it passes the wheel, said support means including a post and a pivot plate pivotally mounted on

said post for adjusting the position of the buffing surface with respect to the surface of the workpiece and a support frame pivotally mounted on said pivot plate,

means on said support frame for driving said buffing wheel, and means for balancing the weight of the buffing wheel, said balancing means includes a threaded rod connected to



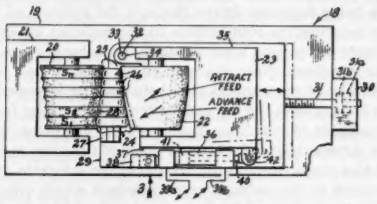
the supporting means and the main frame, a pair of compression springs mounted on the rod on opposite sides of the support means and a nut on the rod on each side of the compression springs for adjusting the force of the springs acting on the support means, whereby the buffing wheel will follow the surface of the workpiece.

4,107,881

CENTERLESS GRINDING MACHINE

Wilbur F. Jessup, The Hague, Netherlands, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jun. 6, 1977, Ser. No. 803,569
Int. Cl.² B24B 5/32
U.S. Cl. 51—103 R **8 Claims**



1. A centerless grinder, comprising in combination:

a. a base;

b. a grinding wheel, rotatably journaled in a grinding wheelhead on said base;

c. a regulating wheel rotatably journaled in a regulating wheelhead on said base and disposed relative to said grinding wheel so as to form an inlet end and an outlet end between said wheels;

d. a work support located between said wheels, and adapted to support a workpiece of revolution; and

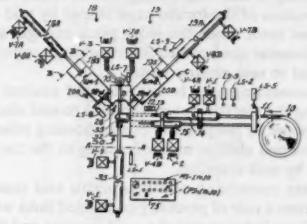
e. means for effectuating relative pivotal feed movement between said regulating wheel and said grinding wheel during the grinding process and varying the feed distances along the face of said regulating wheel relative to said grinding wheel.

4,107,882

DRILL PRE-POINTING MACHINE

Charles Thomas Breitenstein, Elk Grove Village, Ill., assignor to Spiral Step Tool Company, Elk Grove Village, Ill.

Filed May 6, 1977, Ser. No. 794,671
Int. Cl.² B24B 3/26
U.S. Cl. 51—118 **16 Claims**



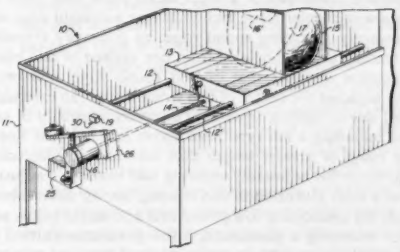
1. In a grinding machine operative to grind substantially simultaneously both ends of workpieces such as drill bodies, first and second individually shiftable grinding heads each including a corresponding grinding wheel movable to and from respective starting positions and a working position; presettable means operative to limit the forward grinding movement of said grinding heads in the direction of said working position; a workhead carried on a transfer table shiftable from a starting position to said working position and including a rotary through-bore chuck operative to seize a workpiece with opposite ends thereof exposed in space for engagement respective with one of said wheels at said working position responsive to advance of the wheels in forward movement of the grinding heads relative thereto; drive means operative in timed action to move the heads from their starting positions to the working position in timed relation with advance of the wheels against corresponding ends of the workpiece to respectively preset limits under control of said presettable means and thereafter effect reverse movement of the heads in return to starting position and opening of the chuck as an incident to return of the workhead to such starting position; together with loading means operative in timed relation to movement of the workhead back to starting position to transfer a workpiece from a source of supply into said chuck.

4,107,883

APPARATUS FOR CONTROLLING FEED MECHANISMS OF GRINDING AND CUTTING APPARATUS

Kenneth E. Bein, 2518 Last Ave., Kingman, Ariz. 86401

Filed Jul. 13, 1977, Ser. No. 815,222
Int. Cl.² B24B 49/16
U.S. Cl. 51—165.8 **5 Claims**



1. An apparatus for cutting or abrading materials having hardness variations comprising:

a frame,

a table for supporting a work piece movably mounted on said frame,

a feed screw mounted on said frame and threadedly connected to said table for controlled movement of said work piece relative to said frame,

an electric motor having a rotor journaled in its housing,

said rotor being coupled to said feed screw for actuation thereof,

said housing of said motor being free to rotate responsive to the reaction of the torque experienced by said feed screw and said rotor when the work piece engages a tool,

a potentiometer control means for varying a source of power coupled to said electric motor,

means connecting said housing to said control means for varying the electric power supplied to said electric motor in response to the position of said housing relative to said rotor of said electric motor reacting to the torque experienced by said rotor,

said means connecting said housing to said control means comprises a pair of pivotally connected links with the free end of one link connected to said housing and the free end of the other link connected to said control means,

switching means mounted on said frame for controlling the energization of said electric motor,

said switching means being actuated to open circuit condition by a predetermined movement of said means connected to said housing, and

means for mounting a tool on said frame against which the work piece carried by said table is moved adjacent to.

4,107,884

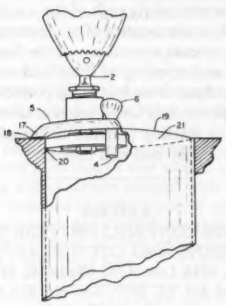
CYLINDER RIDGE GRINDER

Charles F. Morris, 305 Stage St., Tenino, Wash. 98589

Filed Nov. 3, 1976, Ser. No. 738,371

Int. Cl.[2] B24B *15/02, 19/00*

U.S. Cl. 51—245 **2 Claims**



1. An electric drill powered cylinder ridge grinder having a body portion composed of a sheet metal plate; said plate including a semicircular plane section having a straight edge and a downwardly extending round edge; an internally threaded hub extending perpendicularly from one surface of said plate, in a direction opposite that of said round edge; and being disposed adjacent the center of said straight edge; an externally threaded sleeve bearing adjustably disposed internally of said hub and including a nut-type head above said hub; the sleeve bearing being of greater length than said hub and including locking means for adjustably securing said bearing in adjusted position; a shaft journaled in said bearing having means above said plate for connection to a power drill and means below said plate for mounting a grindstone; a flat grindstone carried by said shaft with a peripheral surface thereof disposed adjacent said downwardly extending round edge; a guide pin disposed along said straight edge and extending from said plate in the same direction as said grindstone; and a stabilizing knob disposed on said plate at said guide pin and extending from said plate in the direction of said drill whereby the grinder may be guided around the cylinder opening with the guide pin and the rotating grindstone in contact with the cylinder wall ridge.

4,107,885

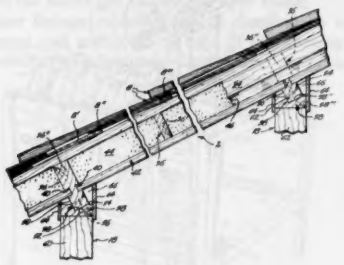
PREFABRICATED ROOF SECTION

Sir Walter Lindal, 1120 8th Ave., #1201, Seattle, Wash. 98101

Filed Jul. 8, 1976, Ser. No. 703,644

Int. Cl.[2] E04B *7/02;* **E04D** *1/00*

U.S. Cl. 52—90 **34 Claims**



30. A building structure having a roof section obliquely mounted thereon, comprising a substrate of stiff sheathing-like material having a quadrilateral outline and a roof covering on the rooftop thereof which comprises a series of relatively offset but overlapping shingle-like roof plates that are arranged in two parallel relatively transversely offset but overlapping courses of the same that are superposed over one another and the substrate, respectively, so as to form a projecting lip along one side edge of the roof section and a complementary shoulder along the opposing side edge thereof, there being a pair of relatively vertically and horizontally spaced stops on the structure, and means on the bottom of the substrate which define a pair of spaced parallel depending surfaces thereon that are disposed crosswise of the side edges of the substrate and oriented in one serial direction of the roof covering, in abutment against the pair of stops, said depending surfaces of the roof section being defined by a pair of cleat-like projections on the bottom of the substrate which have faces thereon that are oriented in the opposite serial direction of the roof covering, and there being fasteners driven through the projections into the stops securing the roof section to the building structure, said substrate comprising a quadrilateral frame having a pair of rafter-like members along the side edges thereof and three spaced parallel cross members therebetween, the intermediate of which is flush with the top and bottom planes of the frame, and the endmost of which are flush with the top plane of the frame but depend below the bottom plane of the same to form the cleat-like projections on the bottom of the substrate, there being grooves in the endmost cross members which coincide with the bottom plane of the frame, and a sheet-like covering on the bottom of the frame, the ends of which are interengaged in the grooves of the endmost cross members.

4,107,886

PREFABRICATED BUILDING MODULE

Orlando F. Ray, Rio Biedras, and Enrique H. Gutierrez, Condado San Juan, both of P.R., assignors to Systems Concept, Inc., Miami, Fla.

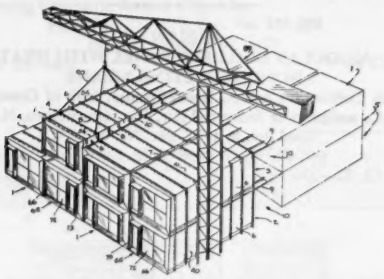
Division of Ser. No. 454,702, Mar. 25, 1974, abandoned, which is a division of Ser. No. 245,090, Apr. 19, 1972, abandoned. This application Feb. 9, 1976, Ser. No. 656,208

Int. Cl.[2] E04B *1/348*

U.S. Cl. 52—79.11 **8 Claims**

1. A building comprising at least one horizontal row of at least two side-by-side lightweight, prefabricated building modules, the one row of building modules forming at least a portion

of one story of the building, each of the prefabricated building modules having at least two opposing side-wall portions, a ceiling portion and a floor portion, each of the two side-wall and ceiling portions including a thin panel of concrete-like material and a plurality of vertical open-web elongated reinforcing members, each of which includes longitudinal edge members spaced-apart and extending substantially parallel to one another and a web extending between the edge members substantially throughout the length thereof, the reinforcing members extending across the outer surface of the thin panel in the manner of studs, with an edge member of each reinforcing member being embedded in the thin panel and extending substantially to the outer surface thereof, and the other edge member and at least a portion of the web of each reinforcing member extending outwardly from said outer surface; plate means rigidly attached to the upper ends of the longitudinal edge members of each of the reinforcing members of each of the side-wall portions and to the adjacent ends of the longitudinal edge members of reinforcing members of the ceiling portion; and a plate rigidly attached to the lower ends of the



longitudinal edge members of each of the reinforcing members of each of the side-wall portions and the floor portion, respectively, for forming a rigid, box-like structure, each building module in the one row of building modules having at least one side-wall portion thereof adjacent to and spaced-apart from a side-wall portion of an adjacent building module for forming a space therebetween, the thin panels of the adjacent side-wall portions providing a form structure, the reinforcing members of the side-wall portions of adjacent modules extending in staggered nesting relation into the form structure, and a wall disposed between each of the adjacent side-wall portions, the wall being formed by pouring a concrete-like material into at least a portion of the space between each of the adjacent side-walls, the reinforcing members of the adjacent side-wall portions reinforcing the wall formed therebetween and integrally incorporating the building modules on each of the sides of the wall into the wall, the thin panels and the reinforcing members of the adjacent side-wall portions merging with and into the poured concrete wall to form a monolithic reinforced concrete support wall for the floor and ceiling portions of the modules.

4,107,887

SOUND ABSORBING SYSTEM

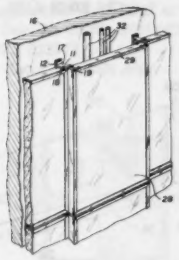
Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jan. 20, 1976, Ser. No. 650,634
Int. Cl.[2] E04B *1/00*
U.S. Cl. 52—105 **10 Claims**

1. A sound absorbing structure comprising the combination of a supporting structure, clips attached to the supporting structure, and sound absorbing panels attached to the clips,

wherein said sound absorbing panels comprise a sound absorbing material with a frame extending around the exterior perimeter of the material, said frame having a plurality of openings for accepting a securing member, and

wherein said clips each comprise a wall plate, a projection extending outwardly from the wall plate, and at least two securing members integrally attached between their ends to the end of the projection opposite the wall plate, said securing members each extending further in one direction from the projection than their extension from the projection in the opposing direction, with a surface of the longer side having a depressed indentation therein spanning the



width of the longer side, and located thereon at a distance from its attachment at the end of the projection equal to the extension on the other side of the projection; and

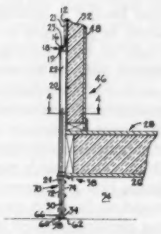
said wall plates clips being attached to said supporting structure and said openings of the frames of the sound absorbing panels engaging the securing members to affix the sound absorbing panels to the supporting structure.

4,107,888

MOBILE HOME SKIRTING

Lynn A. Krueger, 102 Pitcher Park, Devils Lake, N. Dak. 58301

Filed Jul. 5, 1977, Ser. No. 812,501
Int. Cl.[2] E04D *2/38;* E04B *1/34*
U.S. Cl. 52—169.12 **15 Claims**



1. In a mobile home having exterior side walls and a floor, apparatus for enclosing the space between the floor and the ground when the mobile home is in a non-travel mode comprising:

exterior siding secured to each side wall and spaced apart therefrom to define a storage space between said siding and said wall, said siding extending downward and terminating at floor level to define an opening to said storage space proximate said floor;

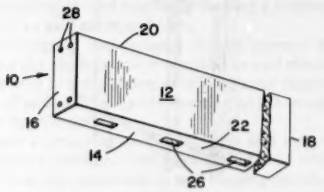
a plurality of rigid skirting panels mounted for vertical reciprocating movement between a first position in which said panels are stored within said storage space for travel and a second position wherein said panels are lowered through said opening into contact with the ground, each panel having top, bottom and lateral edges, an exterior surface and an interior surface, said exterior siding having a vertical dimension at least as large as the distance between said top and said bottom edges of said panels whereby said panels are completely concealed from view in said first position; and

releasable latch means for securing said panels in said first position.

4,107,889
FOUNDATION SYSTEM

Mathew W. Gonsalves, Concord, and Carlos P. Murillo, Walnut Creek, both of Calif., assignors to Gonsalves, Santucci, Inc., Concord, Calif.

Continuation-in-part of Ser. No. 662,491, Mar. 1, 1976, abandoned. This application Dec. 9, 1976, Ser. No. 748,842
Int. Cl.[2] E04B 1/16
U.S. Cl. 52—259 5 Claims



1. A foundation for supporting a building upon a ground surface, the foundation having a number of sections, each section comprising:

at least two vertically elongate concrete pier elements poured in place in holes of predetermined dimensions formed in the ground, each of the pier elements having an uppermost end and at least one axially aligned reinforcing element extending upwardly out of the uppermost end;

at least two pedestals each of the pedestals having an internal surface defining a hollow interior with opposed open ends, one said open end affixed to the uppermost end of a corresponding one of the pier elements, the reinforcing rod extending into the pedestal and terminating at a location intermediate the opposed ends of the pedestal, said other open end disposed above the pier element;

an elongate precast concrete beam placed on at least two of the pedestals and having a parallel transverse aperture vertically disposed in generally overlying relation to a corresponding one of the respective pedestals therebeneath, the minimum distance between opposing portions of the internal surface of each pedestal being substantially greater than the cross-sectional area of each aperture; and

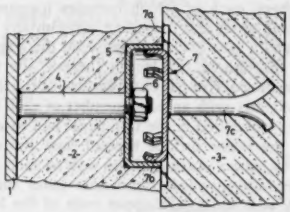
connecting means disposed interior of and extending between each of the apertures and extending into the pedestal therebeneath to connect each pier element to the beam and hold the beam in a predetermined relation with respect to the ground surface, the connecting means including a reinforcing element situated interior of and extending between each aperture and pedestal therebeneath and a bonding agent occupying the interior of each aperture and underlying pedestal.

4,107,890
FASTENING ASSEMBLY FOR REFRACTORY LININGS

Hans Dieter Seghezzi, Vaduz; Bernhard Klimesch, Mauren, both of Liechtenstein, and Reinhold Zsalatz, Rankweil, Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 20, 1976, Ser. No. 752,097
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557846
Int. Cl.[2] E04B 1/16
U.S. Cl. 52—379 5 Claims

1. A fastening assembly for use in securing a refractory lining onto a foundation wall in a furnace or the like, wherein the improvement comprises that said fastening assembly includes a receiving part to be anchored in the foundation wall so that the receiving part is wholly included within the foundation wall, an attaching part detachably connected to said receiving part and extending outwardly from said receiving part, said receiving part including a box-shaped member for securement within the foundation wall, said attaching part comprising a base plate and an anchoring element secured to and extending outwardly from said base plate away from said receiving part, projections being disposed in said base plate and extending therefrom into said box-shaped member for securing

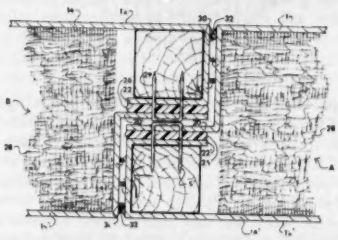


said attaching part to said receiving part, and said projections comprising fingers formed from said base plate and extending outwardly therefrom.

4,107,891
MODULAR BUILDING PANEL WITH HEAT NONCONDUCTING MEANS

Worth Cotton, Jr., and A. Reese Hunter, both of Greensboro, N.C., assignors to Industrial Air, Inc., Greensboro, N.C.

Filed Jul. 8, 1977, Ser. No. 813,872
Int. Cl.[2] E04B 2/28, 2/88; E04C 2/08
U.S. Cl. 52—394 6 Claims



1. A prefabricated building panel comprising:

(a) a pair of identically formed facing sheets joined along opposite side edges thereof and including a fiberglass core between the central planar surfaces of said two facing sheets;

(b) each of said facing sheets including:

(i) a central web section;

(ii) a side wall extending inwardly from each side edge of said web section;

(iii) a first flange extending laterally from the free edge of one of said side walls in a direction toward said core, and a second flange extending laterally from the free edge of the other of said side walls in a direction away from said core, said first and second flanges being substantially parallel to said central web section;

(c) said pair of facing sheets joined together with the first flange of each sheet being joined to the second flange of the other sheet;

(d) a structural support member of a size substantially equal to the space formed by said first flange, adjoining side wall, and opposite portion of said web, and positioned within said space to provide structural support along the edges of said panel;

(e) a flat strip of heat non-conducting material positioned between the adjoining flanges of said pair of facing sheets to minimize transfer of heat from one facing sheet to the other; and

(f) a plurality of fasteners extending through adjacent flanges

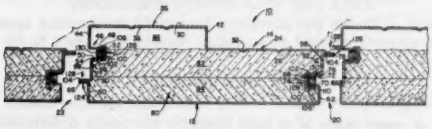
of said facing sheets, through said strip of non-conducting material, and into said structural support member.

4,107,892

WALL PANEL UNIT

Norman A. Bellem, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Jul. 27, 1977, Ser. No. 819,690
Int. Cl.[2] E04B *1/62, 1/74*
U.S. Cl. 52—403 14 Claims



1. A prefabricated wall panel unit capable of being matingly joined with like units in edge-abutting relationship, comprising:

an elongate interior wall panel having a first wing defining flange on one edge thereof and a first channel defining means on another edge thereof;

an elongate exterior wall panel having a second wing defining flange on one edge thereof and a second channel defining means on another edge thereof;

joining means connecting said wing elements to said channel means, said joining means being formed of a material having a thermal conductivity which is low relative to the material of said panels, said wing and channel elements being positioned on said wall panels so that said first channel means is located at the transverse centerline of the wall panel unit and said second channel means is spaced from the wall panel unit transverse centerline, and said first wing defining flange is located adjacent the wall panel unit transverse centerline and said second wing defining flange is spaced apart from the wall panel unit transverse centerline, said second channel defining means having an outer free edge which is located to be essentially co-planar with said interior wall panel one edge, said exterior wall panel one edge being located outwardly of said interior wall panel channel defining means; and

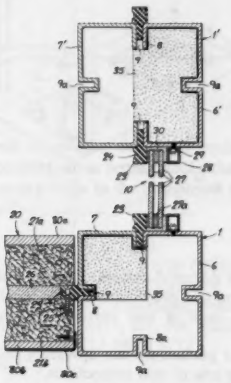
thermal spacer means in each channel defining means for maintaining wing elements of one wall panel unit out of direct thermal contact with channel defining means of an adjoined wall panel unit, said thermal spacer means including deformable strips of low thermal conductivity material mounted in said channels embeddingly receiving said wing-defining flanges and being interposed between adjoined wall panel units, said deformable strips forming a thermal break in a heat path through the wall panel unit whereby direct thermal contact between adjoined wall panel units is prevented so that formation of any continuous heat path between wall panel unit connecting elements is prevented.

4,107,893

PREFABRICATED BUILDING STRUCTURE

Eberhard G. Rensch, Lerchesbergring 24, Frankfurt, Main, Fed. Rep. of Germany (6000)

Continuation-in-part of Ser. No. 562,802, Mar. 27, 1975, abandoned, which is a continuation of Ser. No. 357,838, May 7, 1973, abandoned. This application Apr. 2, 1976, Ser. No. 673,134
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1975, 7528031[U]; Jan. 8, 1976, 2600547; May 13, 1972, 2223457; Jun. 19, 1972, 2229737
Int. Cl.[2] E06B *3/04*
U.S. Cl. 52—775 14 Claims



1. A building structure assembled from prefabricated components, comprising:

a framework formed from rigidly interconnected horizontal and vertical elongate modular units defining a four-sided wall opening between them, said wall opening being bounded by confronting horizontal and vertical faces of said units, each of said faces being provided with a slot extending over the full length thereof, the slots of said faces lying in a common plane;

strips seated in said slots and projecting into said wall opening;

a four-sided wall element occupying said wall opening and resting against said strips; and

retaining means on at least one of said faces for holding said wall element in position adjacent said strips;

said vertical modular units being prismatic metallic columns of substantially uniform wall thickness having inbent wall portions defining the slots thereof, said columns being split along said slots to minimize heat transfer past said strips, said inbent wall portions including a substantially straight first flange and a generally J-shaped second flange enveloping said first flange, said second flange terminating in a lip closely paralleling said first flange.

4,107,894

INTERLOCKING CEMENTITIOUS BUILDING BLOCKS

Wayne L. Mullins, 5001 E. Cactus, Scottsdale, Ariz. 85254

Continuation-in-part of Ser. No. 736,724, Oct. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 582,378, Apr. 30, 1975, abandoned. This application May 23, 1977, Ser. No. 799,725
Int. Cl.[2] E04C *1/10*
U.S. Cl. 52—593 21 Claims

1. An interlocking building block comprising:

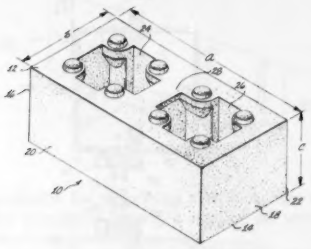
(a) a cementitious body of rectangular solid configuration having an upper horizontal surface and a lower horizontal surface;

(b) eight (8) projections integrally formed to extend normally from the upper horizontal surface of said body, said

projections arranged on the upper surface in a predetermined geometric array;

(c) eight (8) recesses formed in the lower surface of said body and configured to be complemental to said projections, said recesses arranged on the lower surface in the same geometric array as said projections are arranged on the upper surface of said body; and

(d) a spaced pair of passages formed through said body so as to extend between the upper and lower horizontal surfaces thereof, said passages formed in cross-like shapes in horizontal cross section to provide said body with eight



(8) vertically disposed cementitious columnar formations for supporting said projections and in which said recesses are formed, each of said vertical columnar formations comprises,

I. a shelf-like portion on the upwardly disposed end for supporting one of said projections,

II. a reduced mass portion on the downwardly disposed end in which one of said recesses is formed, and

III. a transition portion depending angularly from said shelf-like portion and merging with said reduced mass portion.

4,107,895

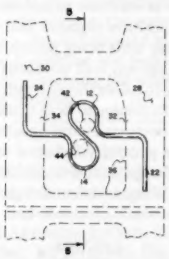
REINFORCING BAR LOCATING MEANS

Carl F. LeGrady, 1024 N. 21st Ave., Phoenix, Ariz. 85009

Continuation-in-part of Ser. No. 633,645, Nov. 20, 1975, abandoned. This application May 9, 1977, Ser. No. 794,833

Int. Cl.[2] E04C *5/18*

U.S. Cl. 52—687 **3 Claims**



1. In a reinforcing bar locating means; a single piece of wire having an S-shaped portion; said S-shaped portion having a pair of generally loop shaped bar receiving portions; said S-shaped portion having a pair of opposite end portions; arm portions integral with said opposite end portions of said loop shaped portions of said S-shaped portion; said arm portions extending in generally opposite directions relative to each other; said arm portions each having an anchor portion integral therewith; said anchor portions being spaced apart a distance substantially equal to a spacing between median areas of opposite side walls of a concrete block; said locating means being sized for disposition in a mortar layer between courses of concrete blocks; said S-shaped portion being disposed to overly a vertical opening between said side walls of a respective concrete block.

4,107,896

SHINGLE-TYPE WALL PANEL

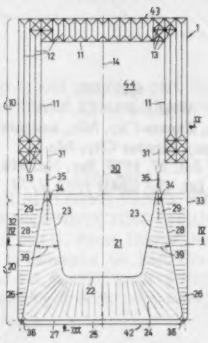
Alfred Wetzel, Weissdornweg 114, 5300 Bonn Bad Godesberg, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 836,070

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642999

Int. Cl.[2] E04D *1/00*

U.S. Cl. 52—537 **10 Claims**



1. A panel made of at least limitedly elastically deformable sheet material and adapted to be mounted shingle-fashion with a plurality of other such panels to an upright wall, said panel having a pair of generally parallel side edges and a pair of generally parallel end edges and when mounted having between said end edges a bend subdividing said panel generally into an upper half having one of said end edges and a lower half having the other of said end edges, said panel further having:

an upper central substantially planar region in said upper half,

an upper downwardly U-shaped and non-planar attachment portion in said upper half at said edges thereof and surrounding said upper central planar region,

a lower central substantially planar region in said lower half contiguous at said bend with said upper planar region and generally coplanar therewith in a relaxed unmounted condition of said panel,

a lower outwardly directed flange in said lower half at said edges thereof and spacedly surrounding said lower planar region, and

a lower upwardly U-shaped contoured and non-planar portion having an inner periphery connected directly to said lower planar region and an outer periphery connected directly to said flange.

4,107,897

SNAP-IN PLASTIC FRAME FOR PANELS

Myron E. Ullman, Jr., Canfield, Ohio, assignor to Kessler Products Co., Inc., Youngstown, Ohio

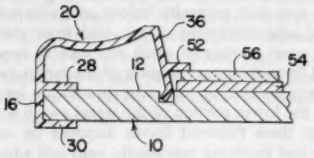
Continuation-in-part of Ser. No. 547,648, Feb. 6, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,800

Int. Cl.[2] E04C *2/38*

U.S. Cl. 52—823 **11 Claims**

1. A contoured decorative trim strip for a panel core having flat parallel front and back surfaces, straight sides, and detents on the front surface parallel to said side surfaces comprising: an elongated extrusion having one straight flat portion adapted to abut against a straight side of said panel; said flat portion having a first rib extending from said flat portion to engage the back surface of said panel; a second rib parallel to and spaced

apart from said first rib extending from said flat portion to engage the front surface of said panel; a flexible decorative generally convex contoured portion extending from the front edge of said flat portion to project over the front surface of said core to define an enclosed space thereunder; finger means



projecting downwardly from said decorative contoured portion remote from said front edge adapted to engage a panel detent when said contoured portion is flexed and thereby extended against said panel; said strip being mitred at opposite ends to align with like adjacent mitred strips when also flexed into detent engagement with said panel.

4,107,898

CHANNEL-SHAPED SEALING, GUIDING OR FINISHING STRIPS AND THE LIKE

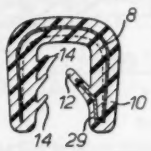
Heinz Andrzejewski; Werner Kruschwitz, and Robert G. Bright, all of Viersen, Germany, assignors to Draftex Development AG, Switzerland

Filed Apr. 26, 1977, Ser. No. 791,108

Claims priority, application United Kingdom, Apr. 26, 1976, 16912/76

Int. Cl.[2] E04C *2/38*

U.S. Cl. 52—716 **10 Claims**



1. A channel-shaped strip structure, comprising
channel-shaped metal carrier means,
a covering of flexible material over and on the metal carrier means,
a gripping rib running along and protruding from one inside wall of the channel and defined by the flexible covering material, and
metal reinforcement which at least partly extends into the gripping rib and is separate from the carrier means and spaced therefrom by the flexible material.

4,107,899

LOAD-BEARING WALLS AND SIMILAR STRUCTURES

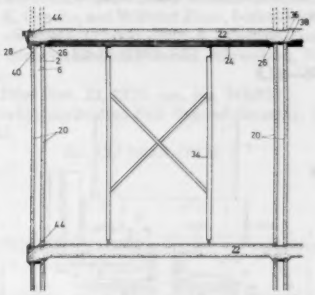
Frederick Crooks, 24 Philamere Ave., Glenmore, Durban, Natal, South Africa

Continuation-in-part of Ser. No. 574,753, May 5, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,903

Int. Cl.[2] E04G *21/02;* E04B *1/16*

U.S. Cl. 52—747 **1 Claim**

1. A method of erecting a building, comprising erecting a jig, placing concrete formwork on said jig, inserting in said formwork the upper ends of storey-high relatively thin-walled precast cured concrete panels having a substantial L-shape in cross-section, placing the panels in opposed and staggered relation to each other, placing the lower ends of the panels in a channel in a base which is below said formwork, the panels extending vertically between the base and the formwork, the formwork extending down below the upper ends of the panels to form pockets on opposite sides of the upper ends of the panels, casting concrete into said formwork to a depth to fill



said pockets and to overlie the upper ends of the panels, whereby the concrete, upon setting, locks the panels together to form load-bearing walls in the completed structure.

4,107,900

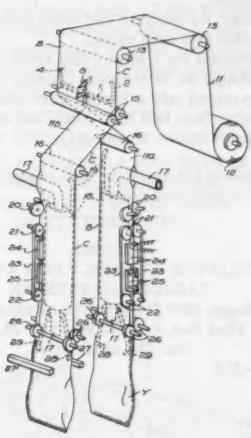
FORMING AND FILLING BAGS OF SYNTHETIC PLASTICS MATERIALS

Shinjiro Izumi, 1-17-5 Ryoke, Urawa-shi, Japan

Filed Jun. 3, 1977, Ser. No. 803,318

Int. Cl.[2] B65B *9/12*

U.S. Cl. 53—180 R **7 Claims**

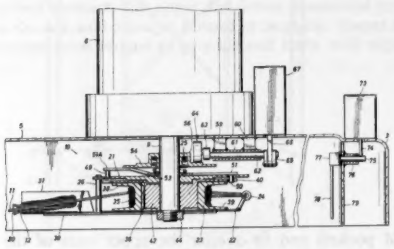


1. Apparatus for forming and for filling bags of a synthetic plastics material, comprising:
feed means for feeding a flattened tube of synthetic plastics material along a predetermined path through said apparatus;
cutting means for cutting said tube substantially along the mid-line thereof to produce two strips of material, each of which strips has two open edges along one side;
a tube constructed to pass between said open edges of each strip of material and to debouch into the interior of each strip;
sealing means for sealing together said open edges of each strip of material to form two further tubes; and
cutting and sealing means for sealing said further tubes transversely to form simultaneously the top and bottom of adjoining bags and for separating said bags from one another.

4,107,901
LAWN MOWER WITH MECHANICAL LINE FEED

Robert J. Moore, Fontana, Calif., assignor to Weed Eater, Inc., Houston, Tex.

Filed Jan. 3, 1977, Ser. No. 756,506
Int. Cl.[2] A01D *53/02*
U.S. Cl. 56—17.5 40 Claims



1. A lawn mower for mowing the vegetation growing on turf comprising:

(a) head means rotatable about an axis substantially perpendicular to a cutting plane and having a spool means movably mounted therein;

(b) drive means for rotating said head means about said axis in said cutting plane;

(c) flexible non-metallic line member having a portion carried on said spool means and further having a free end portion extending outwardly of said head means into the cutting plane;

(d) first means for securing said spool means against movement within said head means;

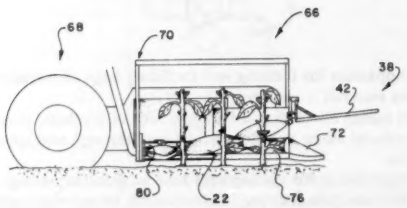
(e) second means for releasing said spool means for movement through an incremental distance within said head means to extend only a discrete incremental length of said line member from said head means and then securing said spool means against movement within said head means; and

(f) third means for actuating said releasing means during rotation of said head means.

4,107,902
LEAF DEFOLIATOR ASSEMBLY FOR AN AUTOMATIC TABACCO HARVESTER

Charles W. Suggs, 1507 Trailwood Dr., Raleigh, N.C. 27606

Filed Nov. 4, 1976, Ser. No. 738,834
Int. Cl.[2] A01D *45/16*
U.S. Cl. 56—27.5 1 Claim

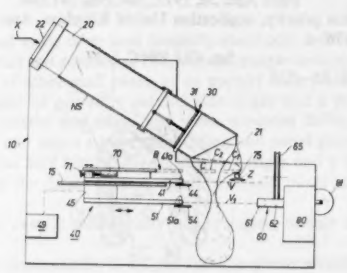


1. A tobacco harvester unit adapted to be mounted and supported adjacent one side of a tractor, said tobacco harvester unit comprising: a frame structure; rotatively driven leaf defoliation means extending generally longitudinally within said harvester unit and including rear and front ends; lateral conveyor means disposed on each side of said harvester unit generally adjacent the rear areas of said defoliating means, said lateral conveyor means extending on each side of said harvester unit from the rear area of said defoliating means forwardly where the lateral conveyor means terminates generally intermediately between the front and rear ends of said defoliator means; longitudinal conveyor means disposed outwardly adjacent said lateral conveyor means for receiving tobacco leaf material therefrom; and a front stationary leaf receiving panel adjoining said lateral conveyor means on each side of said harvester unit just generally below and adjacent the front portion of said defoliating means, said front stationary leaf receiving panel serving to catch and receive leaves initially defoliated from the upper portion of the target swath during the harvesting operation and wherein tobacco leaves remaining about the lower portion of the target swath act to engage and sweep these received leaves disposed on each of said stationary leaf receiving rearwardly onto said adjacent lateral conveyor means where the leaves are conveyed laterally onto said outwardly adjacent longitudinal conveying means.

4,107,903
FULLY AUTOMATIC DEVICE FOR PACKING PIECE GOODS, IN PARTICULAR FRUITS

August Wickersheim, Rellingen, Germany, assignor to Wickersheim & Johne Maschinen-und Verpackungsanlagen GmbH, Rellingen, Germany

Filed Feb. 3, 1977, Ser. No. 765,193
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 7602840[U]
Int. Cl.[2] B65B *61/26, 1/06*
U.S. Cl. 53—138 A 5 Claims



1. A fully automatic apparatus for packing discrete goods such as fruits, including a machine frame with a filling tube adapted to receive a relatively large supply of a telescopically pushed together mesh type hose material, an assembly associated with said filling tube for restraining said hose material supply during withdrawal of the material from said filling tube, said restraining assembly having a brake ring, an assembly for closing a hose section gathered into the shape of a strand by means of ribbon clips encircling said hose strand to define a bottom closure for a subsequent hose section overlying a filling tube discharge outlet, in combination with means for severing a completed package intermediate the closure points, said closing and severing assembly being arranged downstream from said filling tube relative to the direction of movement of the goods from said filling tube into the hose material, and means controlled by said closing and severing assembly for introducing ribbon shaped portions into the space between said hose strand and the ribbon clips encircling the same during the closing operation and for printing price and/or advertising indicia onto said ribbon shaped portions, wherein the improvement comprises a drive mechanism, a carriage (**40**) movably mounted in said machine frame (**19**) underneath said filling tube (**20**) and coupled to said drive mechanism (**49**) for movement in the horizontal direction, said carriage including a pair of vertically spaced supporting plates (**41, 51**) one positioned above the other, an end portion of each of said supporting plates facing said closing and severing assembly (**60**) with said end portions facing said closing and severing assembly (**41***a*, **51***a*) each having a hose web take-up recess (**42, 52**) and in the

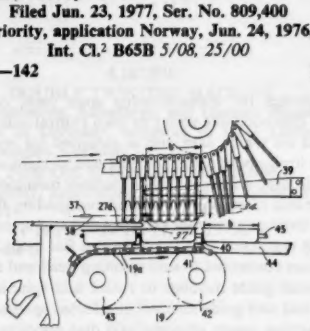
vicinity thereof each having a pair of finger shaped gathering arms (43, 44; 53, 54) rotatably mounted about an associated vertical pivot axis (46, 47; 56 57) for movement transversely across the associated recess, said closing and severing assembly (60) including a closing head (62) defining an entry slot (61) for said hose web facing toward said take-up recesses in the path of movement (V1) of the lower one of said supporting plates (51), the feed track of said lower supporting plate disposed below the feed track (V) of the upper one of said supporting plates (41), and the movement of said pair of supporting plates being positively controlled by said carriage drive mechanism during advance movements of said carriage.

4,107,904

MACHINE FOR LOADING FISH IN BOXES

Willy Helgesen, Madla, Norway, assignor to Trio Engineering Ltd., Forus, Norway

Filed Jun. 23, 1977, Ser. No. 809,400
Claims priority, application Norway, Jun. 24, 1976, 762182
Int. Cl.² B65B 5/08, 25/00
U.S. Cl. 53—142 18 Claims



1. A machine for loading fish in boxes which comprises:

(a) a first conveyor supporting a series of transport containers thereon, said first conveyor serving to transfer fish sideways while each is disposed in its respective transport container in a preselected position with the heads of fish in adjacent containers facing in opposite directions and the bellies directed upwards;

(b) cooperating feed means for supplying fish to said transport containers of said first conveyor and a second conveyor for receiving said fish from said first conveyor, said second conveyor having a series of catch devices each adapted to engage its respective fish and effect transfer thereof to an associated box for deposition therein;

(c) means for driving said first and second conveyors at a uniform speed in a continuous circulatory movement, the relative disposition of said conveyors being such that a local region of the path of movement of said catch devices of said second conveyor coincides with a local region of the path of movement of said transport containers of said first conveyor enabling said catch devices to engage their respective fish in their respective transport containers one after each other; and

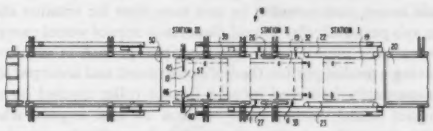
(d) cooperating, co-travelling check elements adapted to cause said fish to be retained on said second conveyor in groups between corresponding groups of catch devices within a preselected region of the path of movement of said second conveyor between a first position in which the fish are lightly clamped together between the catch devices and a second position in which a group of fish can be transferred to an associated box.

4,107,905

PROCESS AND ARRANGEMENT FOR THE REMOVAL OF THE PACKING FROM PACKED OBJECTS

Diethelm W. K. Grocke, and Wilfried Jäger, both of Nuremberg, Fed. Rep. of Germany, assignors to NUTRO Patentverwertungs- und Maschinenhandels GmbH, Nuremberg, Fed. Rep. of Germany

Filed Nov. 22, 1976, Ser. No. 743,838
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1975, 2552163
Int. Cl.² B65B 43/26
U.S. Cl. 53—3 9 Claims



1. A process for the removal of a rectangular foil packing including top, bottom, front, rear and side walls of a package of bottles comprising the steps of:

conveying the package of bottles through several stations on a first horizontal conveyor, step by step,

slitting said foil packing along predetermined cutting lines by automatically controlled cutting apparatus to develop along said cutting lines a foil flap at the top and front of the packing,

turning back said foil flap under the bottom of said foil packing in the direction of transport of said horizontal conveyor, below the conveying plane of said conveyor,

clamping down said turned back foil flap beneath the conveying plane of said horizontal conveyor, and

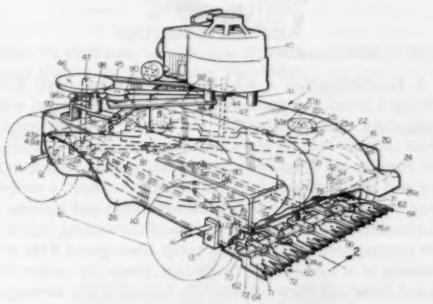
removing bottles horizontally from the remaining foil packing in the direction of conveyance movement of said horizontal conveyor.

4,107,906

IMPACT ACTUATED LAWN MOWER

Walter F. Cousino, 4830 W. Bancroft, St. Toledo, Ohio 43615

Filed Feb. 16, 1977, Ser. No. 769,206
Int. Cl.² A01D 55/00
U.S. Cl. 56—246 4 Claims



1. An impact actuated lawn mower having a wheel mounted base plate, comprising a plurality of individual pairs of presharpened, permanently assembled scissor-like forked blades secured in overlying pivoted relationship by a rivet, said pairs being arranged in side-by-side aligned relationship across the forward edge of said base plate, one blade of each pair being detachably secured to the forward edge of said base plate, the other blade of each pair of blades being pivotally, reciprocatingly movable across the one blade to produce a cutting action, an actuating bar disposed generally parallel to the alignment of said pairs of scissor-like blades, overlying said blades, and

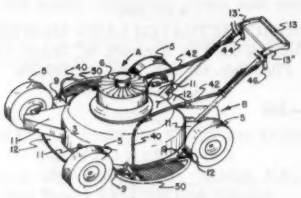
having a pin and slot connection with each of said movable blades, whereby longitudinal reciprocation of said bar effects concurrent reciprocation of all of said movable blades, a first force transmitting lever disposed generally perpendicular to said actuating bar and having one end thereof pivotally connected to said bar and the other end thereof pivotally connected to a rear portion of said base plate, a second impact lever disposed in laterally spaced, parallel relationship to said first force transmitting lever, said second lever having one end thereof pivotally connected to said actuating bar and the other end thereof pivotally connected to the rear portion of the base plate, an impact wheel lying between and in the same plane as said levers, and mounted on said base plate for rotation about an axis perpendicular to said plane, said impact wheel carrying at least one impact roller on its periphery, each of said levers having a medial portion thereof constructed and arranged to be momentarily impacted by said impact roller carried by said impact wheel during each rotation of said impact wheel, whereby said actuating levers are respectively repeatedly successively impacted by said roller in opposite directions, and means for rotating said impact wheel at relatively high speeds to cause rapidly repeated impacts with said levers to in turn impart rapid intermittent reciprocating movements to said actuating bar, thereby producing rapid intermittent reciprocating movement of said movable blades, with a dwell period of substantial duration interposed between each successive movement of the movable blades.

4,107,907

CUTTER BLADE GUARD FOR MOWERS

Harry T. Rutherford, 609 N. Second St., Martinsburg, W. Va. 25401

Filed Aug. 23, 1976, Ser. No. 716,871
Int. Cl.[2] A01D *75/20*
U.S. Cl. 56—320.2 **2 Claims**



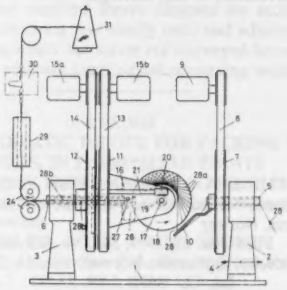
2. In combination, a wheel-supported rotary type mower having a closed top and an open bottom housing, and wheel-supporting means supporting the mower housing being on front and rear axes for allowing a back and forth movement of the mower, and a handle secured to said mower for manipulating said mower in said back and forth movement, a propeller type cutter blade rotatably supported within said housing in a horizontal plane adjacent the bottom of the housing, and means for rotating said cutter blade, a cutter blade guard fixed to the housing in a substantially horizontal plane, the cutter blade guard being in a plane adjacent the bottom of the housing and below the plane of the rotatable cutter blade, the improvement comprising; said cutter blade guard being fixed to at least one side of said housing and having a hinged portion wherein the edge of said hinged portion adjacent the housing extends in a line from front to rear of the side of the mower and in a plane perpendicular to the axes of the wheel-supporting means, hinged means for connecting the said hinged portions to said housing, means for moving the hinged portion of the cutter blade guard between the substantially horizontal and a substantially vertical position and means for remotely operating the moving means.

4,107,908

METHOD AND APPARATUS FOR MANUFACTURING A SPUN YARN FROM ONE OR SEVERAL FILAMENTS

Heinrich Spühler, Oberägeri, Switzerland, assignor to Aktiengesellschaft Fr.Mettler's Söhne, Maschinenfabrik, Switzerland

Filed Jun. 7, 1977, Ser. No. 804,245
Claims priority, application Switzerland, Jun. 15, 1976, 7633/76
Int. Cl.[2] D02J *1/00;* D01H *7/00, 7/46;* D02G *3/34*
U.S. Cl. 57—1 R **10 Claims**



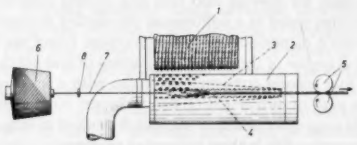
1. A device for manufacturing spun yarn, comprising a rotatable disc rotatable about its own central axis, and a spinning head on which said disc is mounted for rotation being rotatable itself about a longitudinal axis at right angles to the axis of said disc, a filament guide member mointed for rotation about the axis of said spinning head and guiding filament onto said disc during rotation of said disc and said spinning head so as to form segmental partly overlapped flat loops on said disc, drive means connected to said spinning head and said disc and said filament guide member to rotate said spinning head and said disc and said guide member at selected speeds, and pickup and conveying means adjacent said disc opposite to said filament guide member for picking up the twisted yarn from said disc and conveying it away from said spinning head as it is twisted by rotation of said spinning head.

4,107,909

APPARATUS FOR SPINNING TEXTILE FIBERS

Ernst Fehrer; Helmut Fuchs, and Franz Konig, all of Linz, Austria, assignors to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G., Linz, Austria

Filed Jan. 7, 1977, Ser. No. 757,587
Claims priority, application Austria, Apr. 8, 1976, 2568/76
Int. Cl.[2] D01H *1/12;* D02G *3/36*
U.S. Cl. 57—5 **1 Claim**



1. Apparatus for spinning textile fibers into a spun yarn, which comprises:

(a) two air-permeable suction drums having axes parallel to each other and disposed closely beside each other to define therebetween a tapering gap extending parallel to the axes of the drums, the drums being arranged to rotate in the same sense,

(b) suction means defining on the peripheries of the suction

drums respective air-permeable suction zones adjoining the gap and facing each other,

(c) a source of a yarn core positioned adjacent one end of the gap and arranged to supply the yarn core to the gap between the facing suction zones and in a path parallel to the axes, the yarn core being twisted by the rotating drums about its axis in said gap,

(d) means for supplying flying fibers into the gap between the facing suction zones, and

(e) yarn withdrawing means positioned adjacent another end of the gap opposite the one end and arranged to draw off the spun yarn in said path while holding the spun yarn against rotation

(1) whereby the flying fibers and the yarn core are spun into a yarn in the gap between the facing suction zones when the drums are rotated in the same sense.

4,107,910

DOUBLE TWISTING MACHINE

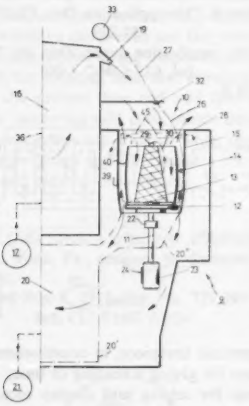
Joachim Fürstenberg, Aichelberg, and Dietmar Hencke, Butzbach, both of Germany, assignors to LTG Lufttechnische GmbH, Stuttgart, Germany

Filed Oct. 4, 1976, Ser. No. 728,968

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 2544141

Int. Cl.[2] D01H *11/00, 13/30*

U.S. Cl. 57—34 R **14 Claims**



1. In a double twisting machine which includes at least one twisting station, said twisting station having a protective container surrounding a payoff bobbin and a turntable for providing thread rotation, the improvement comprising:

nozzle means for supplying air to the vicinity of the top of said protective container, said nozzle means being mounted on said twisting station and supplied with air which is pre-conditioned with respect to at least one of the parameters of temperature and humidity; and

said protective container being provided with an opening in its respective end near said turntable for permitting the flow of at least portions of said pre-conditioned air therethrough.

4,107,911

PNEUMATIC SPINNING APPARATUS

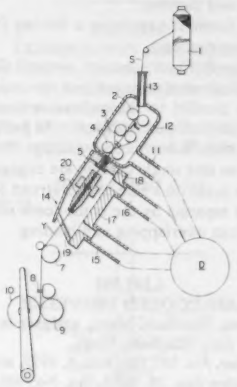
Makoto Yamana, Joyoshi, and Nobunori Kubota, Nagaokakyoshi, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyotoshi, Japan

Filed Jun. 14, 1977, Ser. No. 806,486

Claims priority, application Japan, Jun. 18, 1976, 51-80859[U]; Jun. 23, 1976, 51-83069[U]; Jan. 8, 1977, 52-1142[U]

Int. Cl.[2] D01H *11/00;* **D02G** *1/16*

U.S. Cl. 57—56 **7 Claims**



1. A cover means for a pneumatic spinning apparatus comprising a cover having four sides closed and being disposed between a draft zone and nip rollers to cover an entire spinning nozzle zone, and at least one air suction tube connected to the interior of the cover, whereby the air suction tube sucks and removes fly wastes generated from the spinning nozzle zone and is utilized for enhancing the effect of discharging air from the spinning nozzle, said cover comprising a body member and a lid which is connected to the body member by means of a hinge to be freely opened or closed, spinning nozzles are fixed to the body member and said air suction tubes are also connected to the body member.

4,107,912

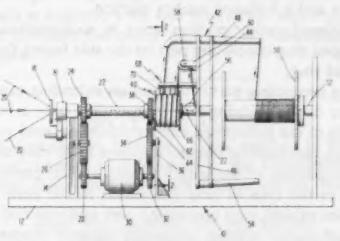
METERING CAPSTAN

William W. Pockman, and Thomas W. Pockman, both of 2872 Quail Hollow Rd., Clearwater, Fla. 33519

Filed May 3, 1977, Ser. No. 793,410

Int. Cl.[2] D01H *13/04*

U.S. Cl. 57—68 **9 Claims**



1. In combination with a rope making machine in which separate strands of rope are twisted together and drawn through a forming die by a capstan assembly mounted on a frame and then directed by a flyer assembly onto a take-up

spool, the improvement wherein said capstan assembly comprises:

a rotatably disposed single capstan having a smooth cylindrical peripheral wall and a hollow central shaft, said capstan including a radially outwardly extending flange on each end of said peripheral wall to preclude an advancing rope strand from slipping off the ends of said single capstan;

means on said frame cooperating with said single capstan to guide the twisted rope strand from said forming die through said hollow capstan shaft and around the peripheral wall of said capstan;

means on said frame for applying a driving force to rotate said single capstan; and

a separating comb fixedly carried on said flyer assembly with the teeth thereof arranged in a row, said row aligned substantially parallel to the capstan axis with the distal ends of said teeth disposed adjacent the peripheral wall of said capstan such that adjacent windings of the advancing rope strand on said single capstan are engaged at no more than a single point on a side of said strand for each winding and kept separate by the comb teeth and thereby are prevented from overlapping and binding.

4,107,913

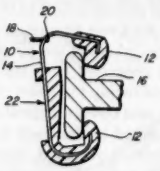
AIR-COOLED TRAVELER

Andrew J. Wayson, Needham, Mass., assignor to Litton Industrial Products, Inc., Hingham, Mass.

Continuation of Ser. No. 547,723, Feb. 6, 1975, abandoned. This application Jun. 28, 1976, Ser. No. 700,665

Int. Cl.[2] D01H *7/60*

U.S. Cl. 57—125 **7 Claims**



1. A traveler for use with a spinning ring having a vertical flange,

said traveler having a ring contacting part and a heat conductive yarn contacting part anchored to said ring contacting part,

said ring contacting part comprising a single J-shape whose curved portion is adapted to embrace the lower edge of said vertical flange and guide the traveler about the center of said spinning ring,

said yarn contacting part having a curved yarn guiding portion extending about the upper edge of said vertical flange and a J-shaped anchor portion,

said J-shaped anchor portion being in juxtaposition to said J-shaped ring contacting part on the side facing the center of said ring,

said ring contacting part having means extending toward the center of the spinning ring surrounding only a fractional length of the juxtaposed anchor portion of said yarn contacting part leaving directly exposed to air movement the major portion of the length of said anchor portion adjacent to the area of heat generation in the yarn guiding portion of said yarn contacting part said exposed portion of said anchor portion presenting surfaces exposed to air movement at least in the direction which faces the center of the ring and in oppositely facing directions which are mutually perpendicular to the ring center line and a ring diameter to provide maximum dissipation of frictional heat.

4,107,914

METHOD OF MANUFACTURING TWISTLESS YARN AND YARN OBTAINED BY THIS METHOD

Jacobus Maurits Van Dort, Almelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Continuation of Ser. No. 673,405, Apr. 5, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,932

Claims priority, application Netherlands, Apr. 22, 1975, 7504728

Int. Cl.[2] D02G *3/40, 3/04*

U.S. Cl. 57—164 **7 Claims**

1. A method of manufacturing twistless or substantially twistless yarn from a stable fibre material, including the sequential steps of:

(a) wetting a sliver or roving of said stable fibre material with a liquid mixture comprising a first portion and a second portion which is a latent solvent for at least a portion of the stable fibre material and which evaporates at a higher temperature than said first portion;

(b) drafting the sliver or roving in a wet condition to form a thinner fibre strand;

(c) false twisting the fibre strand;

(d) heating the strand to an increased temperature so as to remove at least the first portion of said liquid mixture, while leaving at least the second portion;

(e) heating the strand to a further increased temperature so as to activate the latent solvent; and

(f) drying the fibre strand by evaporation of the solvent.

4,107,915

ELECTRONIC TIMEPIECE

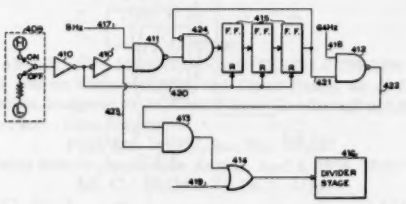
Fukuo Sekiya; Shigeru Morokawa, and Yasushi Nomura, all of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd, Tokorozawa, Japan

Division of Ser. No. 668,839, Mar. 22, 1976, and a continuation-in-part of Ser. No. 584,821, Jun. 6, 1975, abandoned, which is a continuation of Ser. No. 422,553, Dec. 6, 1973, abandoned. This application Dec. 17, 1976, Ser. No. 751,889

Claims priority, application Japan, Dec. 28, 1972, 47-1802

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **5 Claims**



1. In an electronic timepiece, in combination:

display means for giving a reading of time;

switch means for setting said display means, said switch means being manually operable in a short-duration first mode and a long-duration second mode;

timing means connected to said switch means for distinguishing between said modes;

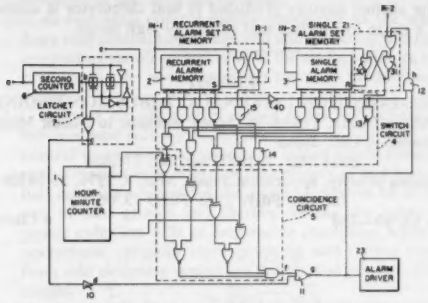
a source of stepping pulses for changing the reading of said display means; and

circuitry extending from said switch means to said display means for changing said reading at a relatively slow rate by pulses manually generated by operating said switch means in said first mode, said circuitry being controlled by said timing means for connecting said source to said display means in response to operation of said switch means in said long-duration mode for changing said reading at a relatively fast rate by said stepping pulses.

4,107,916
ELECTRONIC WATCH HAVING AN ALARM MEANS

Kenichi Kondo, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 21, 1976, Ser. No. 734,431
Claims priority, application Japan, Oct. 28, 1975, 50-129578; Oct. 28, 1975, 50-129579
Int. Cl.² G04C 21/00; G04B 23/06, 23/12
U.S. Cl. 58—38 R 5 Claims

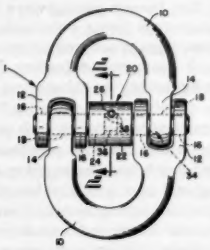


1. In an electronic alarm watch: a counter for counting a repetitive time signal and for developing a count representative of present time; a first alarm memory for storing a signal representing a first alarm time; a second alarm memory for storing a signal representing a second alarm time; a coincidence detecting circuit connected to receive the contents of said counter for comparing the contents of said counter with another signal applied to said coincidence detecting circuit and for developing an output signal when the compared signals coincide; means for alternately applying the signal stored in said first memory and the signal stored in said second memory to said coincidence detecting circuit to effectuate alternate comparison of the respective signals stored in the memories and the count representative of present time; alarm means responsive to the output of said coincidence detecting circuit for emitting an alarm signal when an alarm time and the present time coincide; and means responsive to the output of said coincidence detecting circuit for clearing said first memory after coincidence between the present time and said first alarm time is detected and for rendering said coincidence detecting circuit ineffective to develop an output signal when the present time passes through zero hours and zero minutes corresponding to the contents of said cleared first memory.

4,107,917
COUPLING LINK LOCKING ASSEMBLY

Richard H. Fink, York, Pa., assignor to Campbell Chain Company, York, Pa.

Filed Sep. 8, 1976, Ser. No. 721,293
Int. Cl.² F16G 15/04
U.S. Cl. 59—85 5 Claims

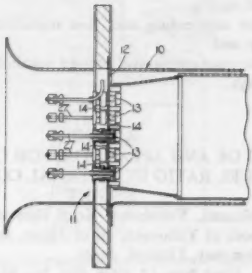


1. A locking assembly for interconnecting two members having aligned apertures therein comprising a hinge pin having a groove therein inserted through said aligned apertures, retention means to hold the hinge pin in a preselected axial position in which the members are coupled to said hinge pin for interconnection, said retention means including a blind end bore intersecting and aligned with the hinge pin groove when the hinge pin is inserted and a locking pin driven into said blind end bore for partial receipt in said hinge pin groove to effect the couple, with the inserted end of the pin being enclosed by the bind end bore to preclude removal of such locking pin by a reverse driving force.

4,107,918
COMBUSTION ASSEMBLY

Gordon Edward Andrew, Burnley, and George Edward Bunn, Clitheroe, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 8, 1976, Ser. No. 739,743
Claims priority, application United Kingdom, Nov. 7, 1975, 46152/75
Int. Cl.² F02G 1/00
U.S. Cl. 60—39.71 6 Claims



1. A combustion assembly comprising a plurality of fuel spraying devices, each of which includes a body having air and fuel passages therein and also having at least one outlet communicating with said air and fuel passages so that a mixture of fuel from said fuel passage and air from said air passage is ejected therefrom in use; a baffle plate on which said plurality of fuel spraying devices are mounted with the outlets thereof disposed on a downstream side of the baffle plate with respect to the intended direction of air flow through the assembly in use; and a plurality of air admission apertures through said baffle plate, said apertures being disposed between said fuel spraying devices to ensure substantially uniform mixing of said fuel and air mixture and air passing through said apertures in use, and wherein the body of each fuel spraying device comprises two parts, of which a first, nozzle part contains said at least one outlet and has an abutment which engages the baffle plate on the downstream side thereof and a spigot which extends through an opening in the baffle plate, and a second, collar part is engaged with said spigot, the baffle plate being clamped between the collar part and the abutment on said nozzle part.

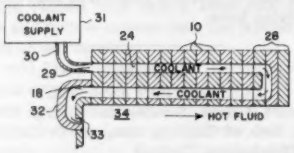
4,107,919
HEAT EXCHANGER

Daniel E. Sokolowski, Hinckley, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,847
Int. Cl.² F02K 11/02
U.S. Cl. 165—169 21 Claims

11. A rocket combustion chamber having a closed injector end and an open exhaust end with injector element openings in said closed end and comprising of:

a plurality of thin metal rings stacked and maintained under tension, each ring comprising an inner wall, an outer wall, and fins extending radially between the inner and outer walls, said walls and fins being established by a plurality of cooling channel openings which are no greater than 0.040 inchs in circumferential width; each ring being rotated slightly with respect to the preceding one to establish a plurality of spiral cooling channels;



a first manifold at said open end of the chamber in communication with said plurality of cooling channel openings;

a second manifold at said closed end of the chamber in communication with said plurality of cooling channel openings;

a coolant supply;

means for connecting said first manifold to said coolant supply; and

means for connecting said second manifold to said injector openings.

4,107,920

METHOD OF AND APPARATUS FOR CONTROLLING AIR/FUEL RATIO IN INTERNAL COMBUSTION ENGINE

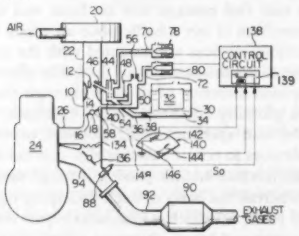
Hidehiro Minami, Yokohama; Kenji Ikeura, and Giichi Shioyama, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 12, 1975, Ser. No. 631,313

Claims priority, application Japan, Nov. 13, 1974, 49-136575[U]; Apr. 10, 1975, 50-48815[U]; Apr. 8, 1975, 50-47519[U]

Int. Cl.[2] **F02B** *75/10*

U.S. Cl. 60—276 **1 Claim**



1. In an automotive internal combustion engine having a carburetor including main and low-speed fuel supply circuits connected in use to fuel storage means, an exhaust system, a sensor mounted in said exhaust system for detecting the air-to-fuel ratio of the exhaust gases and for producing a signal representative of the detected air-to-fuel ratio and control means including a control circuit which is electrically connected to said sensor and is operative in response to the signal from said sensor to produce a control signal and solenoid-operated main and low-speed air delivery control valves which are disposed respectively in said main and low-speed fuel supply circuits and are electrically connected to said control circuit, said solenoid-operated control valves being operative in response to the control signal from said control circuit to control the supply of additional air to the fuel in said main and low-speed fuel supply circuits to thereby maintain within a predetermined relatively high range the air-to-fuel ratio of the air-fuel mixture produced in said carburetor, an apparatus for improving the power output characteristics of the engine comprising detecting means for detecting variations of load conditions of the engine, said detecting means including a potentiometer which is operatively connected to a throttle valve of the engine for producing an electric signal in response to high load operating condition of the engine, and additional control means including a normally closed relay which is opened in response to the electric signal from said potentiometer to thereby cut the electrical connection between said solenoid-operated control valves and said control circuit thus causing said solenoid-operated control valves to be closed whereby the air-fuel ratio of the air-fuel mixture produced in said carburetor is altered into a range lower than said relatively high range.

4,107,921

FUEL-INJECTION INTERNAL COMBUSTION ENGINE

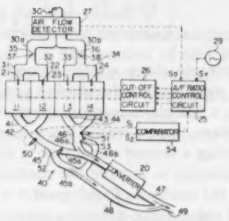
Haruhiko Iizuka, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Mar. 7, 1977, Ser. No. 775,056

Claims priority, application Japan, Mar. 8, 1976, 51-24108

Int. Cl.[2] **F01N** *3/15;* **F02D** *13/06*

U.S. Cl. 60—288 **4 Claims**



1. An automotive multiple-cylinder fuel-injection internal combustion engine comprising:

(1) a plurality of groups of power cylinders each having intake and exhaust ports,

(2) an air intake system including intake passageways each communicating within the intake ports of the power cylinders of each of said groups,

(3) a fuel-injection system including fuel injection nozzles respectively communicating with the intake ports of the power cylinders of said groups,

(4) an exhaust system including (a) exhaust passageways each communicating with the exhaust ports of the power cylinders of each of said groups and (b) first and second branch passageways leading downstream from each of said exhaust passagways,

(5) flow shut-off valve means provided between each of said exhaust passageways and the branch passagways leading from the particular exhaust passageway,

(6) exhaust-gas processing means provided in said exhaust system for cleaning the exhaust gases to be passed therethrough,

the respective first branch passageways leading from said exhaust passageways being communicable downstream with said exhaust-gas processing means and the respective second branch passageways leading from said exhaust passageways by-passing the exhaust-gas processing means,

said flow shut-off valve means having a first condition providing communication between each of said exhaust passageways and said exhaust-gas processing means through the associated first branch passageway and a second condition closing said associated first branch passageway and providing communication between each of the exhaust passageways and the second branch passageway leading from the particular exhaust passageway,

(7) exhaust sensors respectively provided in said exhaust passageways for detecting the concentrations of oxygen in the exhaust gases to be passed through the respective exhaust passageways and thereby producing output sig-

nals representative of the respective detected concentrations of oxygen,

(8) comparator means operative to compare the respective output signals from said exhaust sensors with each other for passing therethrough the signal which is representative of the lowest one of said detected concentrations of oxygen;

(9) detecting means for detecting prescribed operational variables of the engine for producing output signals representative of the detected variables,

(10) air-fuel ratio control means responsive to the signals from said comparator means and said detecting means for controlling the air-to-fuel ratio of the air-fuel mixture to be produced in the power cylinders toward a predetermined value;

(11) cylinder cut-off control means operatively connected between said fuel-injection system and said air-fuel ratio control means for controlling the fuel-injection system in such a manner as to interrupt the delivery of fuel from the fuel injection nozzles for the power cylinders of at least one of said groups and thereby having the particular power cylinders held in inoperative conditions when the operational variables represented by said output signals from said detecting means are within said predetermined ranges,

said cylinder cut-off control means being further operatively connected to said flow shut-off valve means for controlling the valve means between the first and second conditions thereof depending upon the signals from said detecting means so that the valve means is in the first condition and in the second condition thereof when the power cylinders of the group communicating with the exhaust passageway which is associated with the particular valve means are in the operative and inoperative conditions, respectively.

4,107,922

EQUIPMENT FOR EXHAUST GAS DETOXIFICATION IN INTERNAL COMBUSTION ENGINES

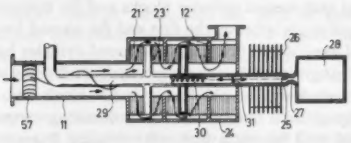
Günter Wössner, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 392,311, Aug. 28, 1973, Pat. No. 3,962,869. This application Feb. 11, 1976, Ser. No. 657,048

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1972, 2243428

Int. Cl.² F01N *3/15*

U.S. Cl. 60—298 **2 Claims**



1. In equipment for exhaust gas detoxification of internal combustion engines of the type that includes an exhaust system with an exhaust manifold and an exhaust pipe and at least one thermal or catalytic reactor within the exhaust system, the improvement comprising: a heat pipe within which a working fluid flows; said heat pipe containing three zones, a first zone serving as an evaporation zone and accepting heat from the exhaust gas, a second zone serving as the transport zone for the transport of the working medium between the first and third zones and a third zone serving as a condensation zone and giving off heat to its surroundings, said condensation zone including at least one secondary, independently operating, heat pipe connected to the condensation zone in the reactor; a radially permeable capillary tube lying within the first mentioned heat pipe such that through and along its interior the working medium flows in a vapor phase towards the condensation zone and along its outside the working medium flows in a liquid phase toward the evaporation zone; and flow-scoops disposed within the exhaust system upstream of the reactor and serving to create a swirl of the exhaust gases for the purpose of improved heat transfer in the reactor.

4,107,923

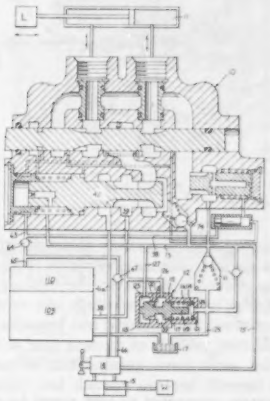
LOAD RESPONSIVE VALVE ASSEMBLIES

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 522,324, Nov. 8, 1974, Pat. No. 3,998,134, and Ser. No. 655,561, Feb. 5, 1976. This application Aug. 20, 1976, Ser. No. 716,360

Int. Cl.² F15B *13/08*

U.S. Cl. 60—427 **14 Claims**



14. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, outlet fluid conducting means, exhaust means connected to reservoir means and load pressure sensing means operable to transmit a control signal to control means operable to vary flow delivered from said pump to said inlet chamber, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber, said fluid exhaust means and said load pressure sensing means, said first valve means having variable metering orifice means operable to throttle fluid flow between said load chambers and said fluid exhaust means, second valve means interconnecting said fluid inlet chamber and said fluid supply chamber, said second valve means having means responsive to pressure upstream of said variable orifice means and means responsive to pressure in said fluid supply chamber and operable to maintain said pressure upstream of said variable orifice means at a relatively constant predetermined level when said fluid supply chamber is connected to one of said load chambers by said first valve means and said load chamber is pressurized, said second valve means having isolating means to isolate said fluid supply chamber from said fluid inlet chamber when said fluid supply chamber is connected to one of said load chambers by said first valve means and said load chamber is not pressurized and fluid replenishing means to connect said supply chamber with said exhaust means when said isolating means isolates said fluid supply chamber from said inlet chamber.

4,107,924

PUMP UPGRADING SYSTEM

Joseph E. Dezelan, Western Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1977, Ser. No. 791,901

Int. Cl.² F16H *39/46*; F15B *13/06*

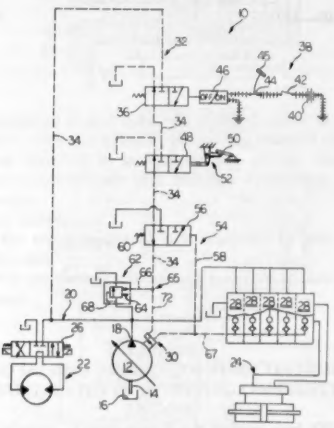
U.S. Cl. 60—445 **27 Claims**

1. A multi-range pressure compensated fluid delivery system

giving pressure compensated output flow over at least two independent pressure ranges, comprising:

a variable displacement pump driven by a prime mover and having an inlet connected to a source of hydraulic fluid and an outlet delivering pressurized fluid;

a fluid delivery circuit connected to said outlet having at least two work circuits selectively connected thereto, a first of said circuits being safely operable up to a first pressure and a second of said circuits being safely operable only up to a second pressure, said first pressure exceeding said second pressure;



an actuator system connected to said pump to control its displacement responsive to a pressure applied thereto;

means for selectively applying a first signal determined by said first pressure to said actuator system to adjust the displacement of said pump; and

means for reducing said first signal to a second signal determined by said second pressure responsive to connection of said second circuit to said fluid delivery circuit and thereby decreasing the operating pressure of said pump.

4,107,925

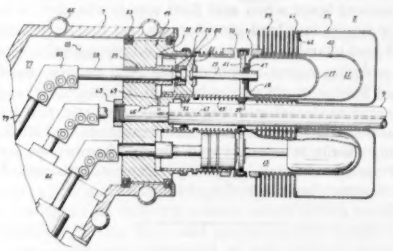
STIRLING ENGINE

Sanders Chapman Watson, 1358 Roller Coaster Rd., Tucson, Ariz. 85704

Filed Mar. 14, 1977, Ser. No. 777,101

Int. Cl.² F02G *1/04*

U.S. Cl. 60—521 **16 Claims**



1. An external combustion engine operating in accordance with the Stirling cycle, said engine comprising in combination:

(a) a first cylinder bank comprising four cylinders symmetrically disposed about a first centrally located longitudinal axis of said first bank and a first cylinder lock disposed at the lower end of said first cylinder bank for rigidly securing the lower end of each of said cylinders;

(b) a second cylinder bank comprising four cylinders symmetrically disposed about a second centrally locaed longitudinal axis of said second bank and a second cylinder block disposed at the lower end of said second cylinder bank for rigidly securing the lower end of each of said cylinders;

(c) means for dividing each of said cylinders into a displacer cylinder in axial alignment with a power cylinder to prevent gas flow between said displacer cylinder and said power cylinder, each of said displacer cylinders and said power cylinders having an upper portion and a lower portion;

(d) a power piston disposed in each said power cylinder of said cylinders in said first and said second cylinder banks;

(e) a displacer piston disposed in each said displacer cylinder of said cylinders in said first and said second cylinder banks;

(f) first means for rigidly connecting in spaced relationship each axially aligned displacer piston and power piston within each respective one of said cylinders in said first cylinder bank;

(g) second means for rigidly connecting in spaced relationship each axially aligned displacer piston and power piston within each respective one of said cylinders in said second cylinder bank;

(h) first crossover means for permitting gas flow between each of said power cylinders in said first cylinder bank and an adjacent one of said displacer cylinders;

(i) second crossover means for permitting gas flow between each of said power cylinders in said second cylinder bank and an adjacent one of said displacer cylinders;

(j) means for heating the upper portion of each of said displacer cylinders;

(k) means for dissipating heat from the lower portion of each of said displacer cylinders and for reducing the heat transfer from the upper portion of said displacer cylinders to said power cylinders;

(l) vee transmission means for converting the reciprocating movement of said displacer pistons and said power pistons into rotational motion of said first and said second cylinder banks, said vee transmission means comprising:

i. a transmission housing for rotatably mounting said first and said second cylinder blocks and for maintaining a fixed angle between the first and the second longitudinal axes of said first and said second cylinder banks;

ii. a first group of four shafts each said shaft being slidably mounted within said first cylinder block and axially aligned with one of said first connecting means, each said shaft having a first end extending from said first cylinder block and a second end rotatably coupled to one of said power pistons within said first cylinder bank;

iii. a second group of four shafts each said shaft being slidably mounted within said second cylinder block and axially aligned with one of said second connecting means, each said shaft having a first end extending from said second cylinder block and a second end rotatably coupled to one of said power pistons within said second cylinder bank;

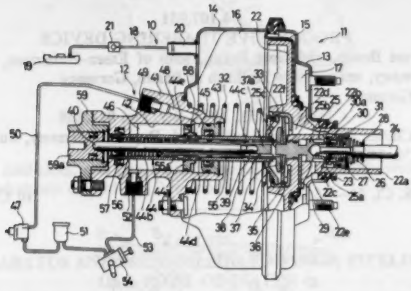
iv. means positioned within said transmission housing for rigidly coupling the first end of each said shaft in said first group to an aligned one of the first end of said shafts in said second group; and

(m) power coupling means for transmitting the rotational motion imparted by at least one of said first second cylinder blocks to a point remotely located from said engine.

4,107,926
BRAKE BOOSTER

Yoshiharu Adachi, Gamogouri, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed May 20, 1976, Ser. No. 688,246
Claims priority, application Japan, Jun. 17, 1975, 50-73504
Int. Cl.[2] B60T *13/12*
U.S. Cl. 60—548 7 Claims



1. A brake booster assembly with a master piston reciprocable in a master cylinder, the booster assembly comprising:

a differential air-vacuum pressure operated booster section including a first power piston, an input member operatively connected with a brake pedal, a first valve means actuated by said input member so as to thereby create a differential fluid pressure which actuates said first power piston, and an output means operatively connected to said first power piston so as to generate a master cylinder output pressure;

a hydraulic pressure operated booster section including a second power piston, means for mechanically and rigidly connecting said first and second power pistons so as to effect the movement of both of said power pistons as one body at all times, and a second valve means actuated by said input member so as to thereby create a differential hydraulic pressure which actuates said second power piston;

a delay means for delaying the actuation of said second valve means so as to commence the hydraulic booster operation after said air-vacuum booster section reaches its run-out condition; and

a common reaction mechanism for both of said booster sections interposed between said first power piston and said input member for causing reaction movement and operation of said output means by said first and second power pistons through said reaction mechanism, said output means including an output rod abutting said master piston and movable relative to both, the first and second power pistons.

4,107,927
EBULLIENT COOLED TURBOCHARGER BEARING HOUSING

Phillip B. Gordon, Jr., Washington, and Keats E. Hunt, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 29, 1976, Ser. No. 745,743
Int. Cl.[2] F02B *37/00*
U.S. Cl. 60—605 6 Claims

1. In a turbocharged, internal combustion engine system, the combination of:

a liquid cooled, internal combustion engine;

a heat exchanger for cooling the liquid from the engine;

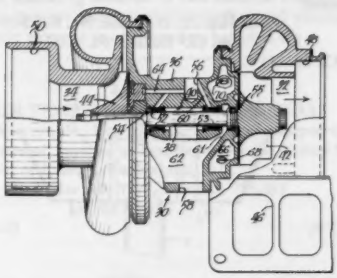
a turbocharger including a rotary turbine and a rotary compressor, housings containing the turbine and the compressor, a shaft interconnecting the turbine and the compressor and bearings journalling the shaft within the housing adjacent the turbine;

means for directing exhaust gases from said engine to said turbine to drive the same;

means for directing air from said compressor to the engine;

a liquid passage in said housing operatively interposed between said turbine and said bearings and having a lower inlet and an upper outlet;

means for directing liquid coolant from said engine to said inlet; and

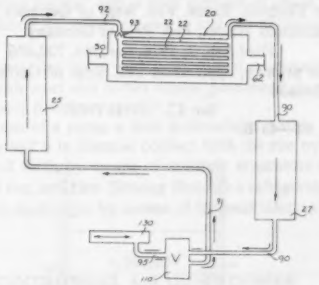


means for directing coolant from said outlet to said heat exchanger whereby thermosiphoning of said coolant through said passage will occur when said engine is not operative and ebullient cooling of said housing immediately adjacent said bearings will occur to the presence of liquid in said passage to thereby prevent excessive heat buildup in said housing even when said engine is not operative and thereby prevent thermal damage to said bearings.

4,107,928
THERMAL ENERGY METHOD AND MACHINE

John C. Kelly, and Brian D. Pardo, both of Reno, Nev., assignors to American Solar King Corporation, Waco, Tex.

Continuation-in-part of Ser. No. 604,017, Aug. 12, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,457
Int. Cl.[2] F03C *1/00*
U.S. Cl. 60—650 15 Claims



1. The method for utilization of thermal energy from a fluid comprising:

pumping fluid containing thermal energy into a container having a heat exchanger therein with a working fluid which flows into and out of said heat exchanger and in an isolated part of the heat exchanger;

discontinuing the flow of fluid containing thermal energy to said container and pumping a second fluid having a different amount of thermal energy to the same container;

causing the working fluid to be introduced into at least one hydraulic cylinder;

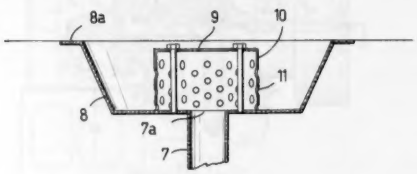
causing the piston within said hydraulic cylinder to move by reason of the introduction of the working fluid therein; and utilizing the movement of the piston to provide mechanical energy.

4,107,929

RAIN WATER ROOF OUTLET OR SIMILAR FOR A BUILDING

Martti Olavi Aladar Ebeling, and Risto Waldemar Lundén, both of Helsinki, Finland, assignors to Kontekla Oy, Helsinki, Finland

Filed Jun. 20, 1977, Ser. No. 808,349
Int. Cl.² E02B *5/08, 9/04*
U.S. Cl. 61—14 **1 Claim**



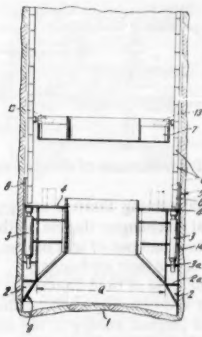
1. A rain water roof outlet for a building, comprising an outlet pipe leading from a roof or some other collecting area to a discharge point, said pipe having a mouth at its upper end, a trough connected to the upper end of said pipe, said trough being wider than the mouth of the pipe, the free upper edge of said trough being located at a higher level than the mouth of said outlet pipe, a lid provided with a closed top surface and fastened above said mouth, said lid being wider than the mouth but smaller than the trough, the lower edge of said lid being located below the upper edge of the trough to prevent the formation of an air whirl in the outlet pipe while the trough is filled with water, and a sieve extending from and about the periphery of said lid and extending between said lid and the bottom of said trough, said sieve surrounding the mouth of the outlet pipe and being provided with perforations, characterized in that the relation between the total area of the perforations of the sieve and the cross-sectional area of the outlet pipe is between 2.5 and 3.5.

4,107,930

METHOD AND APPARATUS FOR SINKING SHAFTS

Theodor Thiehofe, Essen, Fed. Rep. of Germany, assignor to Gewerkschaft Walter, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 720,096
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544834
Int. Cl.² E21D *1/06*
U.S. Cl. 61—41 R **9 Claims**



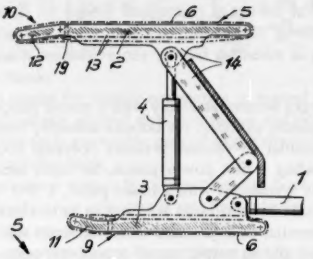
1. A method of sinking shafts particularly in unstable ground, comprising placing an open ended annular shield in a vertical position with its open end positioned into the ground and advancing the shield into the ground, controlling the advancing speed of the driving shield by varying the size of the opening within of the shield to reduce the speed with reduction in the opening area and as a function of the nature of the ground, and lining the excavated shaft behind the shield as it is advanced.

4,107,931

PROGRESSIVE TIMBERING DEVICE

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Germany, assignors to Halbach & Braun, Germany
Germany

Filed Jul. 11, 1977, Ser. No. 814,839
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633799
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **10 Claims**



1. A progressive timbering device, comprising a ridge plate, a sill disposed beneath said ridge plate, a fluid pressure operated pressing cylinder and piston combination disposed between said sill and said ridge plate, at least one of said sills and said ridge plates having an endless track guideway extending around the top and bottom and ends thereof, and an endless track engaged in said guideway and projecting outwardly of the associated one of said sills and said ridge plates, said endless track comprises an endless chain having vertical and horizontal links and including vertically extending engaging humps on said horizontal links between which the vertical links are supported and which project upwardly on the top reach of said chain and downwardly on the bottom reach of said chain, said associated ridge plate and sill having accommodating recesses for the vertical links on both the bottom and top surfaces thereof, the top surface of the associated ridge plate and sill having a hard slide surface over which the horizontal links move.

4,107,932

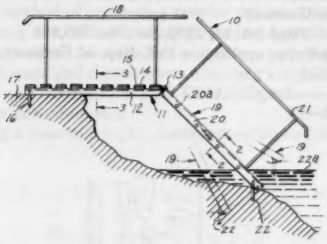
PORTABLE DOCK

Seals R. Cantrell, P.O. Box 679, Cedartown, Ga. 30125

Filed Aug. 24, 1977, Ser. No. 827,162
Int. Cl.² E02B *17/00*
U.S. Cl. 61—48 **1 Claim**

1. A portable dock, comprising, in combination, a platform body and a ladder, hinge means between one end of said platform body and one end of said ladder, an opposite end of said platform body and an opposite end of said ladder, each having a plurality of anchor pins, said platform body being comprised of a pair of parallel spaced-apart channels, a plurality of parallel, spaced-apart slats supported on said channels, and an upwardly extending hand rail along each side of said platform body; said ladder being comprised of a pair of parallel spaced-apart channels, supporting a plurality of transverse extending rungs therebetween, a removable hand rail along each side of said ladder, and said hinge means comprising a transverse extending extension bar across the first said end of said ladder,

said extension being receivable in a slot in an end of each said channel of said platform body, said extension being removable



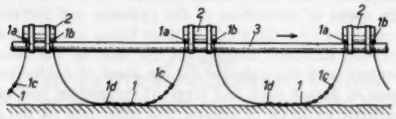
from said slots, and said ladder channels being slidable within said channels of said platform body.

4,107,933

APPARATUS AND METHOD FOR TOWING A PIPELINE IN A BODY OF WATER

Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris", Paris, France

Filed May 17, 1977, Ser. No. 797,697
Claims priority, application France, Jun. 4, 1976, 76 17023
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—107 17 Claims



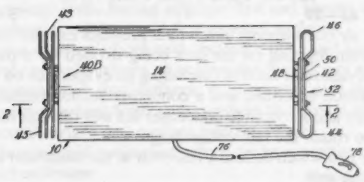
10. In a method of towing a submarine pipeline in a body of water to a point at which it is to be laid on the bed of a body of water, said pipeline having a positive buoyancy and being equipped with trail-ropes distributed along its length so that the pipeline is maintained a certain distance above the bed with the trail-ropes dragging on the bed, the improvement which comprises attaching at least some of said trail-ropes to the pipeline at two points spaced apart therein so that the part of the trail-ropes that drags on the bed is maintained substantially parallel to the longitudinal axis of the pipeline and thereby resisting drift by a transverse current.

4,107,934

PORTABLE REFRIGERATOR UNIT

Shlomo Beitner, Tel-Aviv, Israel, assignor to Bipol Ltd., Tel-Aviv, Israel

Filed Jul. 26, 1976, Ser. No. 708,569
Int. Cl.[2] F25B *21/02;* F25D *3/08;* F28F *7/00*
U.S. Cl. 62—3 15 Claims



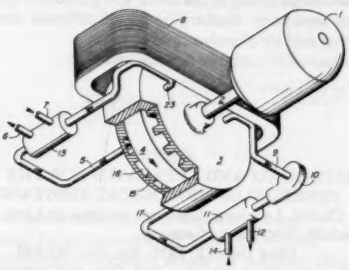
1. A portable refrigerator unit cooled by a thermoelectric element of the Peltier type having hot and cold faces, which comprises an insulated wall, an internal thermal sink imbedded in said insulated wall, having a relatively large portion and a relatively small portion having a face free of said insulating material, a thermoelectric element having its cold face in heat-transfer contact with the free face of said internal thermal sink and the cold portion thereof imbedded in said insulated wall, a heat-dissipating means having an external thermal sink in heat-transfer contact with the hot face of said thermoelectric element, said heat-dissipating means and said hot face being spaced from said insulated wall, and fastening means extending from the relatively large portion of said internal thermal sink through said insulating material to said external thermal sink, for fastening the two thermal sinks together and placing the thermoelectric element in compression between them.

4,107,935

HIGH TEMPERATURE REFRIGERATOR

William A. Steyert, Jr., Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,381
Int. Cl.[2] F25B *21/02*
U.S. Cl. 62—3 18 Claims



1. A high temperature magnetic refrigerator capable of a temperature range of refrigeration load from 2 K to 400 K and operating at a Carnot efficiency of greater than 70% comprising in combination:

(a) motor and shaft means for rotating a wheel, said wheel contained in a housing,

(b) surrounding a portion of the housing is situate a superconducting magnet with a field strength of about 7 Telsa, and wherein the wheel rotates in and out of this magnetic field,

(c) said wheel having a rim composed of a permeable rare earth with inlet and outlet means positioned on the said rim's outer periphery, and

(d) by means of a pump a fluid is circulated within the said housing and is in thermal contact with the rim by passing back and forth by means of multiple separators through the said rim, and then flowing through a refrigeration load and heat exchanger by means of the said inlet and outlet.

4,107,936

CENTRIFUGAL AIR CONDITIONER

Donald Wayne Felder, 837 Hillside Dr., Sherman, Tex. 75090

Filed Jan. 6, 1977, Ser. No. 757,458
Int. Cl.[2] F25B *9/02*
U.S. Cl. 62—5 6 Claims

1. A centrifugal air conditioner comprising:

(a) an elongated, hollow cylinder including a cylindrical air chamber having at one end an air inlet port, and having an opposite outlet end portion,

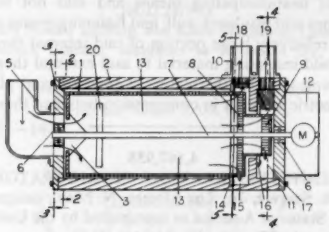
(b) a shaft fixed to and extending coaxially through said cylinder,

(c) journal means mounting said shaft for rotary movement,

(d) a plurality of vanes fixed to, and circumferentially spaced

about, said shaft, said vanes extending substantially the length of said cylindrical chamber and projecting radially from said shaft to the cylindrical wall of said chamber,

(e) a disc-shaped baffle fixed to said shaft closer to said inlet port than said outlet end portion, said baffle intersecting said vanes and having a radius less than the radius of said



cylindrical chamber to separate said air chamber into a pumping chamber adjacent said inlet port and a vortex chamber adjacent said outlet end portion,

(f) discharge means at the outlet end portion of said cylinder for separately discharging air of different temperatures from said air chamber, and

(g) means for rotatably driving said shaft.

4,107,937

METHOD OF AND APPARATUS FOR THE DEEP FREEZING OF BIOLOGICAL SUBSTANCES

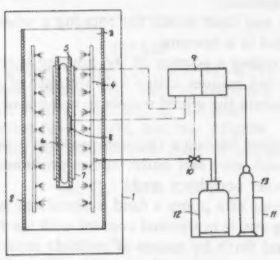
Horst Chmiel, Leonberg, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 21, 1976, Ser. No. 752,930

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557870

Int. Cl.[2] F25D *17/02*

U.S. Cl. 62—64 **11 Claims**



1. A process for the deep freezing of biological substances which comprises the steps of:

enclosing the biological substance to be deep frozen in a bioreceptacle; 'determining the temperature-time curve for the outer wall of said bioreceptacle which corresponds to the temperature gradient necessary to freeze all of said biological substance within the receptacle with an effective cell survival rate and

subjecting the bioreceptacle to heat exchange with a fluid coolant at a temperature sufficient to deep freeze said biological substance while controlling the temperature applied to the outer surface of said bioreceptacle as a function of time to conform to said temperature-time curve whereby the biological substance within the receptacle is subjected substantially exactly to said temperature gradient.

4,107,938

METHOD OF AND APPARATUS FOR COOLING A COOKED CONFECTIONERY

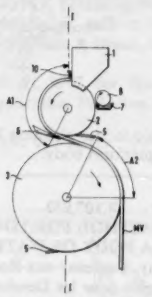
Helmut Sollich, Kalletal, Germany, assignor to Sollich KG, Bad Salzuflen, Germany

Filed Jul. 14, 1976, Ser. No. 705,131

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534131

Int. Cl.[2] A23G *3/12*; F25C *1/14*

U.S. Cl. 62—71 **4 Claims**



1. A method for cooling a cooked confectionery mass, comprising:

continually depositing a thin sheet of hot confectionery mass onto the upper side of a cooling cylinder rotating about a horizontal axis, the cooling temperature of the cylinder, the speed of revolution of the cylinder and the rate of deposition by weight of the mass being so chosen as to provide sufficient cooling of the side of the mass in contact with the cylinder for the sheet of confectionery mass to detach itself and drop off the bottom part of the cylinder by force of gravity, the other side of the mass remaining substantially uncooled; and

providing a second cooling cylinder positioned below the first cylinder and rotating in a direction opposite therefrom, in such a position as to receive the sheet of mass which has dropped off of the first cylinder, with the uncooled side of the sheet of mass in contact with the surface of the second cooling cylinder, and to carry the sheet of mass along the circumference thereof, the cooling temperature and the speed of rotation of the second cooling cylinder and the size and position thereof relative to the first cooling cylinder being chosen as to provide sufficient cooling of the mass to completely cool the confectionery mass to the temperature required for further processing.

4,107,939

APPARATUS FOR REDUCING EXTERIOR CONDENSATION IN AN AIR CONDITIONER

Theodore S. Bolton, Liverpool, and Charles N. High, Cazenovia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,873

Int. Cl.[2] F25B *47/00*; F25D *17/06*

U.S. Cl. 62—89 **5 Claims**

1. An air conditioning unit which prevents exterior condensation from forming on the unit being divided by a partition into an evaporator section containing an evaporator on which condensation is formed and a condenser section containing a condenser and a rotatable condenser fan and the unit having a motor to rotate the fan, comprising:

a base pan which defines a reservoir in the condenser section of the unit;

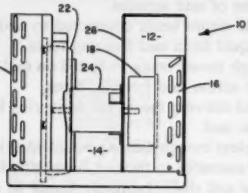
fluid transfer means from the evaporator section to the reservoir; and

a condenser fan shroud which divides the reservoir into two parts and which has sluiceways communicating with the

reservoir located in the condenser fan shroud, whereby air pressure differentials resulting from fan rotation cause the condensation in the reservoir to circulate through the sluiceways eliminating pockets of cold condensation.

4. The method of preventing exterior condensation in an air conditioning unit, said unit being divided by a partition into an evaporator section containing an evaporator on which condensation is formed and a condenser containing a condenser and a rotatable condenser fan, and the unit having a motor to rotate the fan, which comprises:

locating a reservoir in the condenser section of the unit;



transferring condensate from the evaporator to the reservoir;

dividing the reservoir into two parts with a condenser fan shroud containing an opening for the condenser fan; and

providing sluiceways in the condenser fan shroud communicating with the reservoir whereby air pressure differentials resulting from rotation of the fan cause the condensation in the reservoir to circulate within the reservoir and through the sluiceways eliminating pockets of cold condensation.

4,107,940

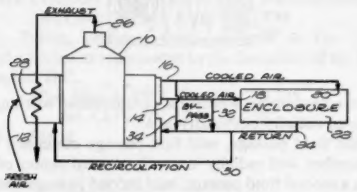
EVAPORATIVE REFRIGERATION SYSTEM

Leslie A. Schlom, 5524 Saloma Ave., 91411; Michael B. Dubey, 5518 Saloma Ave., both of Van Nuys, 91411, and Andrew J. Becwar, 818 Old Landmark La., La Canada, all of Calif. 91011

Division of Ser. No. 601,873, Aug. 4, 1975, Pat. No. 4,023,949. This application Feb. 7, 1977, Ser. No. 766,304

Int. Cl.[2] **F28C** *1/00;* **F28D** *5/00;* **F02M** *15/00;* **F24F** *3/12*

U.S. Cl. 62—121 **12 Claims**



1. A method of applying cooled fresh air to an enclosure utilizing air returned therefrom as a working fluid, comprising:

applying vaporizable liquid to first exposed surfaces of heat exchange walls having opposite first and second exposed surfaces to moisten said first exposed surfaces;

flowing return air from said enclosure over said moistened first exposed surfaces, as at least the majority of air flowing over said first surfaces, to evaporate said liquid by abstracting heat from said members to thereby cool said second surface and moisten said return air;

discharging said moistened return air to a position outside said enclosure;

flowing fresh air from outside said enclosure into thermal conductive contact with said cooled second exposed surfaces, as the majority of air flowing into said contact, to cool said fresh air; and

conducting at least a portion of said cooled air to said enclosure.

4,107,941

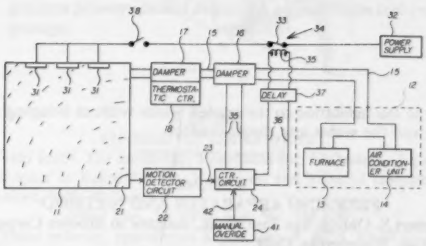
ENVIRONMENTAL CONTROL SYSTEM

Stuart R. Hamilton, 3 Bent Hill Dr., Framingham, Mass. 01701

Filed Nov. 28, 1975, Ser. No. 636,075

Int. Cl.[2] **F25D** *17/04*

U.S. Cl. 62—186 **7 Claims**



1. An environmental control system comprising:

an enclosure for accommodating human activities;

an environmental conditioner means for inducing change in the natural environmental temperature conditions within said enclosure;

human presence detector means for distinguishing between the presence or absence of humans within said enclosure; and

thermostatic control means for causing said conditioner means to establish a given temperature in said enclosure in response to detection of any human presence by said detector means and an override control means to establish a substantially different temperature in said enclosure in response to a total evacuation of the enclosure as detected by said detector means.

4,107,942

COOLING SYSTEM

Stanley W. Fairman, 8780 E. McKellips Rd., #111, Scottsdale, Ariz. 85257

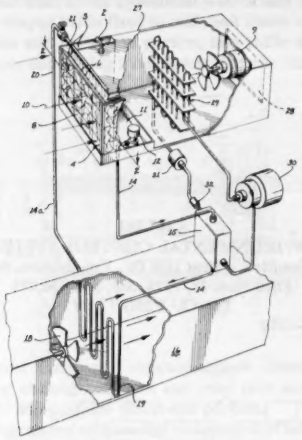
Filed Mar. 31, 1977, Ser. No. 783,107

Int. Cl.[2] **F28D** *5/00*

U.S. Cl. 62—305 **9 Claims**

1. A habitation cooling system comprising the combination of a compression refrigeration system; an evaporative cooler, having means for evaporating water by contact with moving air whereby said air and water are cooled; means for moving

air cooled by said evaporative cooler over the condenser of said refrigeration system; means for transferring heat from the



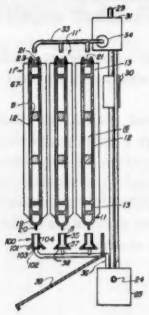
air in the habitation to the cooled water without bringing the air and the water into direct contact.

4,107,943

FREEZING APPARATUS AND METHOD

Robert S. Ohling, San Jose, Calif., assignor to Acoolco Corporation, Watsonville, Calif.

Filed Jun. 2, 1975, Ser. No. 583,196
Int. Cl.[2] F25C *5/02*
U.S. Cl. 62—320 **26 Claims**



1. A freezing unit comprising
(a) at least one evaporator assembly with two freezing faces positioned to be substantially vertical, said freezing faces being planiform surfaces having connected at the periphery thereof an annulus defining a contained volume that runs along a substantial portion of the periphery of said freezing faces and with said freezing faces forms an enclosed central chamber, said chamber being interruptably connected to the contained volume of said annulus,
(b) guide means being connected to said assembly for guiding liquid from said freezing faces,
(c) trough means being mounted on said assembly to deliver liquid across said freezing faces,
(d) liquid delivery means for delivering liquid to said trough means, and
(e) recipient trough means positioned to receive liquid draining from said guide means and to discharge said liquid to said liquid delivery means, the recipient trough means having breaker portions comprised of substantially planer surfaces positioned at an angle to the path of the sheets of frozen liquid released from said freezing faces so that said sheets fall into contact with said planar surfaces and are broken into fragments.

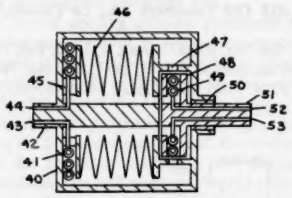
17. A freezing unit comprising
(a) at least one evaporator assembly with two freezing faces, said freezing faces being planiform surfaces, and said freezing faces having connected therebetween an outer annulus having a contained volume that runs along a substantial portion of the periphery of the freezing faces and with said freezing faces forms a central chamber, said chamber being interruptably connected to the contained volume of said annulus,
(b) guide means being connected to said assembly for guiding liquid from said freezing faces,
(c) trough means being mounted on said assembly to deliver liquid across said freezing faces,
(d) liquid delivery means for delivering liquid to said trough means, and
(e) recipient trough means positioned adjacent to said evaporator assembly to receive liquid draining from said guide means and discharging the liquid to said liquid delivery means, the recipient trough having breaker portions comprised of substantially planar surfaces positioned at an angle to the path of the sheets of frozen liquid released from said freezing faces so that said sheets fall into contact with said planar surfaces and are broken into fragments.

4,107,944

HEAT PUMP WITH TWO ROTORS

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 407,665, Nov. 18, 1973, Pat. No. 4,047,392, Ser. No. 591,881, Jun. 30, 1975, abandoned, and Ser. No. 618,456, Oct. 1, 1975, Pat. No. 4,005,587. This application Jan. 13, 1977, Ser. No. 759,075
Int. Cl.[2] F25B *3/00*
U.S. Cl. 62—401 **8 Claims**



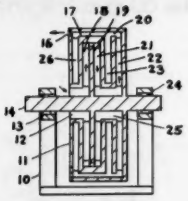
1. In a heat pump wherein a compressible working fluid is circulated radially outwardly in a
a. first fluid passage, said first passage contained in a first member, and radially inwardly toward center of rotation in a second fluid passage, said second passage contained in at least one of said first and second members, said first and second members coaxially arranged, at least one of said members being supported by a shaft for rotation;
said first and said second radial working fluid passages communicatingly connected at their respective outward ends by an outer passage and at their respective inward ends by an inner passage, said radial and outer and inner passages forming a closed loop extending at least partially through both of said members, a working fluid adapted to be circulating through said loop, means for compressing said working fluid by centrifugal force within said loop with accompanying temperature increase, first heat exchange means for cooling said working fluid after compression, said first heat exchange means being carried by one of said members, a second heat exchange means, carried by one of said members, for regeneratively exchanging heat between said working fluid within said inner and outer

passages, and a third heat exchange means carried by one of said members for heating said working fluid after said heat exchange between said working fluid within said inner and outer passages.

4,107,945
THERMODYNAMIC COMPRESSOR

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 675,304, Apr. 9, 1976, Pat. No. 4,060,989, and Ser. No. 600,312, Jul. 30, 1975, Pat. No. 3,986,361. This application Jul. 26, 1976, Ser. No. 708,863
Int. Cl.[2] F25B *3/00*
U.S. Cl. 62—499 **8 Claims**

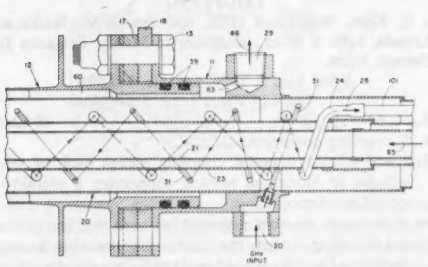


1. A compressor comprising:
a. a rotor mounted for rotation;
b. a continuous fluid passage within said rotor providing:
i. alternately outwardly and inwardly extending fluid passage portions for alternately compressing and expanding a working fluid flowing therein;
ii. an outwardly extending fluid passage means communicating downstream of the downward end of the alternately outwardly and inwardly extending fluid passage portion;
iii. a peripheral portion of the fluid passage communicating downstream of the outward end of the outwardly extending fluid passage means;
c. a heat exchange means carried by said rotor and providing for heat exchange between fluid entering and leaving said outwardly extending fluid passage means.

4,107,946
LOW HEAT LOSS LIQUID HELIUM DISCONNECT ATTACHMENT AND SYSTEM

Vernon L. Potter, Torrance, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1977, Ser. No. 793,335
Int. Cl.[2] F17C *13/04, 13/10*
U.S. Cl. 62—514 R **20 Claims**

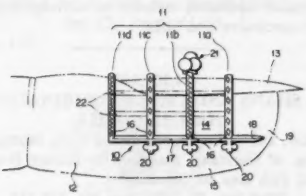


1. A low heat leakage disconnect fitting adapted to interface with magnet dewars and which retains the vacuum integrity of both the dewar and a transfer line connected thereto comprising:
a bayonet-type insert for said dewars having an axial flow passage;
an enclosed inner annular chamber in said insert formed about said axial passage for insulating the passage;
an enclosed outer annular chamber in said insert and means in said outer chamber for conducting gases in both gaseous and liquid form adjacent to the periphery of said inner annular chamber to control the temperature of said dewar and said insert;
means in said insert for selectively diverting the fluid in said axial passage to the periphery of said insert; and
means common to said dewar and said insert for admitting and exiting said gases,
said means for diverting fluid including means for selectively preventing axial flow of fluid from entering said outer chamber,
whereby said insert when in the purge position directs fluid from said axial passage into said means for conducting gases and to the periphery of said insert to selectively alter the temperatures thereof, and when in the through-flow position prevents lateral dispersion of gases from said axial passage.

4,107,947
FINGER TIP ORNAMENT

Takashi Saito, 123 Innai-cho, Funabashi-shi, Chiba-ken, Japan, assignor to Takashi Saito, Funabashi and Takashi Ishiyama, Tokyo, both of, Japan

Filed Dec. 30, 1976, Ser. No. 755,839
Claims priority, application Japan, Jan. 8, 1976, 51-452[U]
Int. Cl.[2] A44C *25/00*
U.S. Cl. 63—2 **13 Claims**

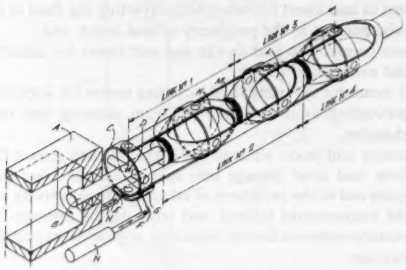


1. A finger tip ornament comprising:
at least one generally C-shaped bridge member open at a bottom thereof and having a non-circular inner surface shape which is substantially complementary to a non-circular surface of a finger tip, said at least one bridge member being adapted to extend around a portion of a fingertip in the transverse direction of the finger with both end portions thereof extending around the lateral sides of the finger tip, said end portions extending to and contacting points near the fingerprint portion whereby said at least one bridge member may be non-rotatably mounted on a finger;
a pair of elongated supporting members connected to respective ends of said at least one bridge member, said supporting members extending lengthwise of the finger tip and substantially perpendicular to said at least one bridge member and adapted to abut against both lateral sides of the finger in the vicinity of the finger tip, said supporting members having retaining portions at the extreme ends thereof which are adapted to be adjacent the tip of a finger, said retaining portions being curved inward towards each other so as to be drawn to each other along the extreme end portion of the finger tip to contact the end portion of the finger tip; and
at least one gem mounted on said at least one bridge member.

4,107,948
FLEXIBLE ROBOT ARM

Ole Molaug, Bryne, Norway, assignor to Trallfa Nils Underhaug A/S, Bryne, Norway

Filed Jan. 31, 1977, Ser. No. 764,237
Claims priority, application Norway, Jan. 30, 1976, 760304
Int. Cl.² F16C 1/02; G05G 1/00
U.S. Cl. 64—2 P 11 Claims

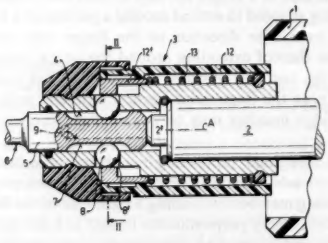


1. Flexible robot arm including of a number of mutually connected rigid links and operatively adapted to perform controlled bending movements driven by robot drive means, wherein successive links of the arm are both interlinked as chain links and hinged to each other between interlinked link ends, in such manner that pair of arm links interlinked with the same intermediate link, are pivotably adjoined at their adjacent extreme ends, one of the terminal links of the arm being pivotably hinged in relation to said drive means and disposed to be operatively driven by the same into controlled angular tilts about said hinge, and the free extreme end of the subsequent link, which is interlinked with said terminal link, being pivotably adjoined with a connection point on the drive means in order to enable operative transfer of corresponding angular tilts to the successive arm links.

4,107,949
TOOL SHANK AND CHUCK COMBINATION FOR HAMMER DRILL

Karl Wanner, Echterdingen, and Klaus Voss, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1976, Ser. No. 725,193
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1975, 2551125
Int. Cl.² F16D 3/06; B23B 31/06, 31/16
U.S. Cl. 64—9 A 14 Claims

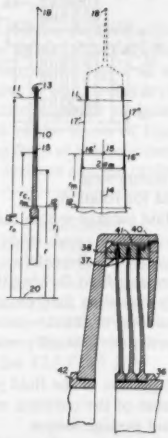


1. In a combination with a chuck having a tool receptacle defining a chuck axis, a rotary and impact tool having a shank defining a tool axis and receivable in said receptacle; cooperating means on said shank and said receptacle for retaining said tool in said receptacle against extraction therefrom while permitting axial displacement of the tool relative to the receptacle so that the tool can transmit axial impact to a workpiece; and means separate from said cooperating means and operative for transmitting torque between said chuck and said tool, including an axially extending groove separate and circumferentially spaced from said cooperating means, said groove being axially open at the end of said shank and having at least one flank extending substantially radially of said tool axis, said torque transmitting means further including a rotary-entrainment formation in said receptacle formed with at least one side flatly engageable with said flank.

4,107,950
FLEXIBLE-DISK COUPLING

Ernest Wildhaber, 124 Summit Dr., Rochester, N.Y. 14620

Filed May 26, 1977, Ser. No. 801,009
Int. Cl.² F16D 3/78, 3/52
U.S. Cl. 64—13 8 Claims



1. A flexible-disk coupling containing at least one disk decreasing in thickness towards the outside and connected at the outside to a rotary part and at the inside to a mating rotary part of the coupling, whereby in axial sections the straight lines that pass through the mean points of opposite disk profiles in the directions of said profiles, intersect at distances from the disk axis between 2¼ and six times the radial distance of said points from the disk axis, thereby including an uncommon small angle with each other, said mean points being midway between the outer and inner ends of the disk-working surface.

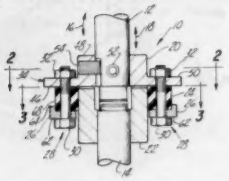
4,107,951
COUPLING

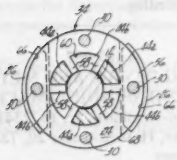
Lee E. Elfes, Bloomfield Hills, and Joseph W. Beckerman, Livonia, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Aug. 9, 1976, Ser. No. 712,978
Int. Cl.² F16D 3/12, 3/64
U.S. Cl. 64—14 10 Claims

1. A coupling comprising:
first and second opposed coupling means each of which includes an elongated portion supporting a plurality of spaced apart projections;
an elastomeric member disposed between the first and second coupling means, the elastomeric member having a plurality of equally spaced apart radially extending fingers which define a plurality of adjacent first and second cavities, the first cavities receiving the projections of the first coupling means and the second cavities receiving the projections of the second coupling means; and
a plurality of securing means securing the first and second

coupling means to the elastomeric member with the elongated portion of the first coupling means being angularly offset with respect to the elongated portion of the second coupling means, each of the securing means including a retainer in contact with one surface of the elastomeric member and spaced away from an adjacent side of the elongated portion of one of the coupling means, the elongated portion of the other coupling means contacting the other surface of the elastomeric member and cooperating with said retainer to confine a portion of the elastomeric member between said retainer and the elongated portion of the other coupling means, the parts being so arranged and constructed that the first and second coupling means do not come into contact with each other.





4,107,952

PROTECTIVE GUARD ASSEMBLY FOR A UNIVERSAL JOINT

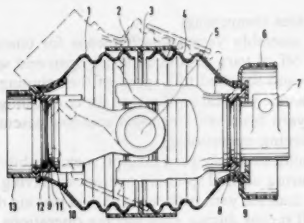
Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,468

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609069

Int. Cl.² F16D *3/84*

U.S. Cl. 64—32 F **3 Claims**



1. In a protective guard assembly for a universal joint between the ends of two shafts, rotatably mounted boots of a resilient elastic material extending over said joint from the shaft ends, an annular guard member disposed around the outer surfaces of said boots and overlapping a portion of each of said boots, said annular guard member having a supporting ring radially positioned around the center of the universal joint and extending radially inwardly between said boots to support the ends thereof.

4,107,953

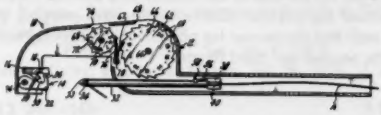
CROCHETING TOOL

Santo Casillo, 9604 156th Ave., Howard Beach, N.Y. 11414

Filed Sep. 19, 1977, Ser. No. 834,333

Int. Cl.² D04B *35/00, 37/00*

U.S. Cl. 66—1 R **9 Claims**



1. A crocheting tool comprising a chassis including yarn-collecting means for receiving and retaining a segment of yarn, a needle slidably mounted in said chassis, positioning means adapted to reciprocate said needle relative to said chassis between a first position in engagement with said yarn-collecting means and a second position remote from said yarn-collecting means, and counting means mounted in said chassis for recording the number of reciprocations of said needle, said counting means comprising a rachet gear rotatably mounted to said chassis and having numerals sequentially printed at its periphery, a resilient actuator mounted to said needle and located to advance said rachet gear as said needle moves from said second position to said first position, and a pawl engaging said rachet gear, said pawl being constructed and arranged to prevent said rachet gear from counter-rotating as said needle moves from said first position to said second position.

4,107,954

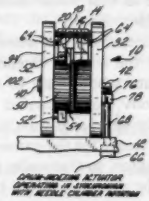
CIRCULAR KNITTING MACHINE PROVIDED WITH A NOVEL STRIPING BOX

Charles Seligson, 160 E. 38th St., New York, N.Y. 10018

Filed Jul. 6, 1976, Ser. No. 702,858

Int. Cl.² D04B *15/58*

U.S. Cl. 66—133 **4 Claims**



1. In a striping box for circular knitting machines comprised of a rotating needle cylinder having cylinder needles, a plurality of yarn-carrying fingers, each finger being individually movable between an inoperative position and an operative position in which it feeds the yarn it carries to cylinder needles receiving yarn from the striping box; and means operative in synchronism with needle cylinder rotation for causing more than one of the yarn-carrying fingers to move into and stay in the operative position throughout at least one complete rotation of the needle cylinder to feed yarn from more than one finger at a time to cylinder needles receiving yarn from the striping box during the at least one complete rotation, said means comprising a control drum provided with a circumferential succession of axial holding slots for holding finger-activating jacks, an indexing arrangement operative for indexing the control drum slot-by-slot at preselected intervals each corresponding to at least one complete rotation of the needle cylinder; and finger-activating jacks removably held in said holding slots including at least one two-legged double jack, the double jack having a first leg portion lying in the associated axial holding slot and a second leg portion projecting radially

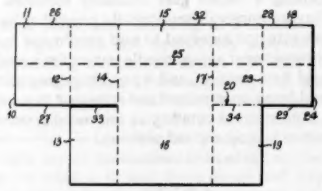
outward of the control drum for finger activation, the breadth of the second leg portion measured in the axial direction of the control drum being such as to simultaneously activate more than one of the yarn-carrying fingers, the plurality of yarn-carrying fingers consisting of a first, second, third and fourth finger arranged successively in the stated order, the breadth of the second leg portion of the double jack and the location of the second leg portion relative to the yarn-carrying fingers being such that the second leg portion simultaneously activates only the second and third fingers.

4,107,955

METHOD OF KNITTING BLANK FOR A SLEEVED GARMENT AND PRODUCT THEREOF

Frank Robinson, and Nigel Stephen Whatmough, both of Breaston, England, assignors to Courtaulds Limited, London, England

Filed Apr. 13, 1977, Ser. No. 787,226
Int. Cl.[2] A41B *9/06*
U.S. Cl. 66—176 **13 Claims**



1. A method of knitting a blank for a sleeved garment, the method comprising the steps of

(a) knitting a sleeve for the garment starting at one end so that the wales extend longitudinally of the sleeve,

(b) knitting a shoulder region for the garment as a continuation of said sleeve so that wales extend along the sleeve and into the shoulder region,

(c) lengthening the knitted courses when knitting said shoulder region so that the courses extend to one side of the shoulder region into a body part of said blank whereby knitting of said body part is carried out contemporaneously with the knitting of said shoulder region,

(d) knitting a second sleeve for the garment as a continuation of said shoulder region, so that wales extend in a continuous line through the sleeves and said shoulder region, and

(e) knitting at least one further part of said body integral with said first mentioned body part so that wales of said at least one further body part extend into said first mentioned body part.

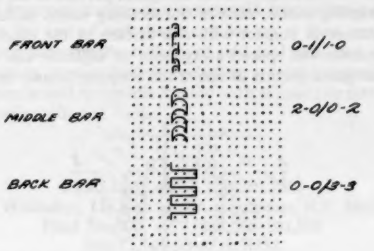
4,107,956

NARROW FABRICS

John T. Parsons, Harrogate, England, assignor to Lightning Fasteners Limited, Wolverhampton, United Kingdom

Continuation of Ser. No. 433,563, Jan. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 191,777, Oct. 22, 1971, abandoned, which is a continuation of Ser. No. 9,960, Feb. 9, 1970, abandoned. This application Nov. 13, 1975, Ser. No. 631,605
Claims priority, application United Kingdom, Feb. 11, 1969, 7385/69
Int. Cl.[2] D04B *21/00*
U.S. Cl. 66—195 **2 Claims**

1. A method for warp knitting a stable sliding clasp fastener carrier tape with a strong selvage resistant to longitudinal and lateral stretch not exceeding 4 inches in full and finished width employing three guide bars in which the front guide bar knits a pillar stitch, the middle guide bar performs a two needle



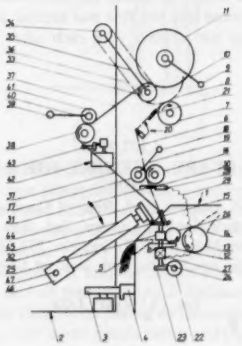
overlap in successive courses and the back guide bar "lays-in" over three or more needles.

4,107,957

MOBILE PIECING DEVICE AND METHOD FOR AN OPEN END SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,581
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620806
Int. Cl.[2] D01H *15/00*
U.S. Cl. 57—34 R **18 Claims**



1. Apparatus comprising:

spinning assembly yarn take-off means for controlling the taking off of yarn produced at an open-end spinning assembly and supplied to a spool of the spinning assembly,

piecing device yarn take-off means for controlling the taking off of yarn from said open-end spinning assembly during yarn piecing operations,

said spinning assembly yarn take-off means exhibiting a yarn path during normal spinning operations having a different length than the yarn path through said piecing device yarn take-off means during yarn piecing operations,

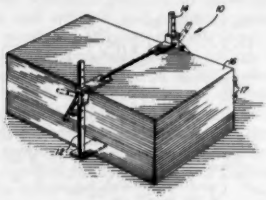
and yarn tranfer means for transferring said yarn from said piecing device yarn take-off means to said spinning assembly yarn take-off means, said yarn transfer means including control means for controlling the respective yarn take-off means and spinning assembly during transfer of said yarn so that a uniform denier is maintained during said transfer which corresponds to the denier produced at the spinning assembly under normal spinning operations, said control means including means for accommodating said length differences of said yarn path during normal spinning and piecing operations.

4,107,958

LOCK FOR STACKED MATERIALS

Paul P. Manley, Jr., 4560 E. Calle Barril, Tucson, Ariz. 85718

Filed Jul. 30, 1976, Ser. No. 710,197
Int. Cl.[2] E05B *73/00;* B65G *1/14*
U.S. Cl. 70—58 7 Claims



1. A security device for deterring theft of stacked articles in sheet form by compressing the articles in a tight stack, said device including:

(a) a relatively flat base plate having a lower surface adapted to rest on a supporting surface, said plate having an upper surface adapted to engage the underside of the lowermost sheet whereby the base can be forced beneath the stacked articles;

(b) an elongate unstanding shaft secured to said base and adpted to extend along a side of the said stack;

(c) a member movable along said shaft including a clamping plate disposed generally opposite said base plate;

(d) engagement means associated with said member and cooperable with said shaft to selectively secure said member and clamping plate in a predetermined position on said shaft whereby said materials are compressed between said base and clamping plate so that individual articles cannot be removed without moving said member; and

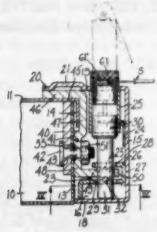
(e) locking means for locking said engagement means in said predetermined position.

4,107,959

METER BOX GUARD LOCK

Thaddeus S. Skarzynski, New Haven, and James A. Swisher, Shelton, both of Conn., assignors to C. Cowles & Company, New Haven, Conn.

Filed Apr. 15, 1977, Ser. No. 787,918
Int. Cl.[2] E05B *65/52*
U.S. Cl. 70—159 10 Claims



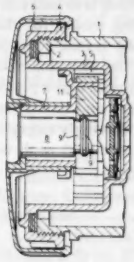
1. A locking assembly for a box having walls and being closed by a flanged cover comprising, an angle piece having a first portion adapted to overlie the cover and a second portion adapted to rest against a wall of the box adjacent the flange of the cover, a bolt passing through and projecting from the box wall and provided with a nut for securing said second portion to said wall with the first portion overlying the cover, a housing covering and enclosing on at least four sides the angle piece and said securing means, and a lock within the housing and holding the housing releasably in covering position, the angle piece having a third portion projecting from the second portion and the housing lock being engageable with said third portion.

4,107,960

ANTI-THEFT PLUG FOR SCREW-THREADED BASE WITH A TIGHTENING TORQUE LIMITING DEVICE

Michel Neiman, Paris, France, assignor to Societe de Diffusion Neiman, Courbevoie, France

Filed Jul. 8, 1977, Ser. No. 813,852
Claims priority, application France, Jul. 26, 1976, 76 22682
Int. Cl.[2] E05B *65/52*
U.S. Cl. 248—165 5 Claims



1. An anti-theft plug for a screw-threaded base comprising:

(a) a plate with a thread corresponding to the threading of the base,

(b) a body rotatable in respect of the said plate,

(c) a cylindrical lock mounted in the said body,

(d) a toothed rim on said plate and

(e) a securing element being rotatable with the rotatable body and serving to render the said body integral with the said plate, having

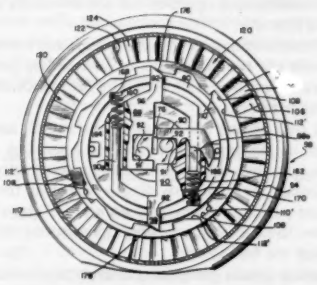
(f) an elastically deformable arm resiliently removable from the axis of the plug under the action of the said lock, while its free end, when the arm has undergone no deformation, it disengaged from said teeth, although it engages them when the arm has undergone deformation.

4,107,961

LOCKING GAS CAP WITH TORQUE OVERRIDE FEATURE

John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 611,219, Sep. 8, 1975, Pat. No. 4,000,633. This application Oct. 29, 1976, Ser. No. 735,252
Int. Cl.[2] B65D *51/16, 55/14*
U.S. Cl. 70—165 11 Claims



1. A locking cap for a fuel tank having a threaded filler neck, said cap comprising an outer shell, a lock assembly, a lock

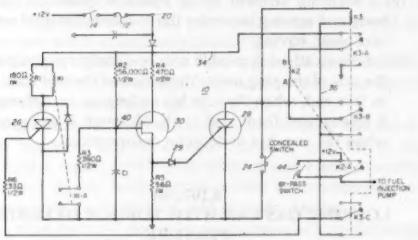
assembly housing disposed within said outer shell and fixed against rotation relative thereto, said lock assembly including a lock having a cap removal position and a locking position and at least one locking bolt, a closure member providing a threaded axially inner portion for engaging the threads on said filler neck, said outer shell and closure member being connected together for relative rotation, said shell and lock assembly defining a concentric annular space therebetween, an annular race disposed within said space for rotation relative to said shell, said race having first and second sets of peripherally spaced apart engaging means, said lock being operatively connected to said bolt for drivingly engaging said bolt with said first set of engaging means for rotating said race with said outer shell when said lock is in said cap removal position, said closure member having means for drivingly engaging said second set of engaging means to provide a torque limited driving connection in the direction which advances said closure member onto said neck and a positive driving connection in the opposite direction, and means for yieldably urging said bolt into a position for drivingly engaging said race to advance said closure member onto said neck when said lock is in its locking position.

4,107,962

AUTO ANTI-THEFT DEVICE

Richard B. MacKinnon, 4613 Stearns Hill Rd., Waltham, Mass. 02154

Filed Apr. 28, 1977, Ser. No. 791,856
Int. Cl.[2] B60R *25/04*
U.S. Cl. 70—243 **8 Claims**



1. An anti-theft circuit for a vehicle having an electrically-operated fuel system, and an ignition switch receiving energy from a battery in the vehicle, said circuit comprising;

electrical bistable means having an enabling position and a disabling position for controlling the operation of the fuel system,

a switch means disposed in the vehicle in a position known by an authorized operator but not known by an unauthorized operator,

means intercoupling the bistable means and switch means to operate the bistable means to an enabling position upon operation of the switch means by the authorized operator,

a timing network,

circuit path means intercoupling the switch means and an input to the timing network for operating said timing network when the switch means is unoperated,

said timing network providing a signal at the end of its timing period to change the state of the electrical bistable means to its disabling position interrupting further operation of the fuel system,

said switch means comprising a momentary switch,

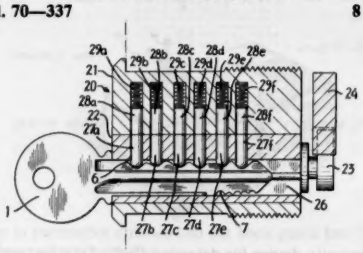
said circuit path means including a semi-conductor latch means for storing an indication of closure of said switch means.

4,107,963

KEY AND LOCK SYSTEM

Noelle Yorio, and Albert E. Yorio, both of 70 West St., Harrison, N.Y. 10528

Filed Mar. 23, 1977, Ser. No. 780,662
Int. Cl.[2] E05B *19/06, 35/08*
U.S. Cl. 70—337 **8 Claims**



1. A lock system comprising a combination of

(1) a first pin-tumbler lock having an outer cylinder and a rotating inner cylinder, the inner cylinder having a key slot and barrel, and tumblers comprising lock pins and corresponding plungers traversing the inner and outer cylinders, wherein the lock pins project into the barrel;

(2) a second pin-tumbler lock, substantially shorter in size than the first lock, having an outer cylinder and a rotating inner cylinder, the inner cylinder having a key slot and barrel, and tumblers comprising lock pins and corresponding plungers traversing the inner and outer cylinders, wherein the lock pins project into the barrel; and

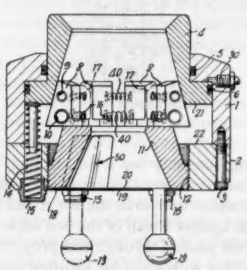
(3) a key having a conventional handle portion and shank portion with a first series of notches and projections extending along one longitudinal edge of the shank portion which engage the tumbler pins of the first pin-tumbler lock upon insertion of the key so as to render the lock operable, and having a second series of notches and projections extending partially along the opposite longitudinal edge of the shank at its outer extremity which engage the tumbler pins of the second pin lock upon insertion of the key to render the second lock operable.

4,107,964

DEVICE FOR CRIMPING TUBULAR ELEMENTS

John Lionel Smith, Goldington Green, England, assignor to Andrew Hydraulics International Limited, Bedford, England

Filed Feb. 22, 1977, Ser. No. 770,910
Claims priority, application United Kingdom, Feb. 24, 1976, 7322/76
Int. Cl.[2] B21D *7/00*
U.S. Cl. 72—36 **10 Claims**



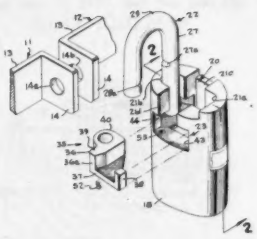
1. A crimping device comprising a plurality of die means disposed around an axis, camming means disposed radially outside said die means relative to said axis, said camming means

being formed such that axial relative movement between said camming means and said die means causes the camming means to drive the die means towards said axis, and a hydraulic actuator operatively associated with said die means and with said camming means for imposing said axial relative movement, said hydraulic actuator having therein an annular hydraulic chanber co-axial with said axis and expandible in said axial direction by hydraulic pressure to cause said axial relative movement, and wherein said camming means is an annular camming member having a radially inner surface portion formed as a camming surface, and having a radially outer surface portion which defines a radially inner surface of said hydraulic chamber of said actuator, said radially inner and radially outer surface portions of the camming member being directly opposite each other in the radial direction, whereby radially outward force of the die means on said radially inner surface is opposed by radially inward hydraulic pressure on said radially outer surface.

4,107,965
PADLOCK HAVING KNUCKLE TYPE ANTI-WEDGE-ATTACK STRUCTURE

James Clayton Miller, Nicholasville; Paul R. Proefrock, Lexington, and James P. K. Peppard, Nicholasville, all of Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Oct. 18, 1977, Ser. No. 843,698
Int. Cl.[2] E05B *67/02*
U.S. Cl. 70—52 **11 Claims**

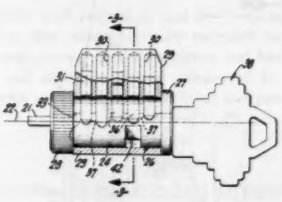


1. A high security padlock for securing in locked condition a pair of companion locking bars having ends providing apertured hasp portions to be locked together in parallel, laterally alined abutment, the padlock comprising a strong penetration and distortion resistant padlock body having a rearwardly opening cavity bounded by a pair of laterally spaced vertical bounding wall surfaces to receive the alined abutting hasp portions therebetween in enshrouded relation shielded by the padlock body against access by attacking tools directed from the front, sides, or bottom of the lock body, the padlock including a shackle having a portion movable from a locking position extending transversely through the cavity and through the apertures of the abutting hasp portions therein and a retracted position enabling withdrawal of the hasp portion from the cavity, a lock mechanism within the padlock body for locking the shackle in said locking position and releasing the same for movement to the retracted position; the improvement comprising a wedge-attack resisting collar member in said cavity adapted to surround three sides of the pair of laterally alined abutting hasp portions at the rear of the lock body for resisting destructive attack by wedge-type attack tools in the zone driven against the rear of the padlock by persons seeking destructive tearing of the padlock shackle forwardly through the hasp portions, the attack resisting collar member comprising side walls defining a hasp-receiving passage therebetween to receive therethrough the laterally alined abutting hasp portions and one of said side walls having a generally cylindrical knuckle formation at the forward end thereof, said padlock body including means defining a pivot socket for said knuckle formation communicating with said cavity adjacent a side thereof, said knuckle formation being pivotally located in said socket for lateral swinging movement of the collar member about a vertical pivot axis therethrough, the one side wall of said collar formation having a contact surface confronting the adjacent lateral face of the adjacent hasp portion and normally located at a predetermined rearwardly diverging angle relative thereto, the collar member having a rear end portion projecting through the rearward opening of said cavity for a predetermined distance beyond the rear of the lock body flanking the opposite sides of the alined abutting hasp portions into said zone to be engaged by the attacking tool when driven against the rear of the lock body, the pivotal mounting of said knuckle formation in said socket imparting a predetermined component of lateral hasp gripping movement to the one side wall of the collar member toward the opposite bounding wall surface when the collar member is driven forwardly by the attacking tool and thereby bring surfaces of the collar member and cavity into increasingly tightening gripping engagement with the opposite lateral surfaces of said hasp portions for resisting destructive tearing and withdrawal of the hasp portions from the cavity.

4,107,966
SELECTIVELY ROTATABLE CYLINDER FOR A LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Apr. 8, 1977, Ser. No. 786,010
Int. Cl.[2] E05B *9/04, 27/04*
U.S. Cl. 70—364 A **2 Claims**



1. A selectively rotatable cylinder for a lock comprising a cylinder body having a bore therein extending along an axis, means defining an axially aligned series of upper tumbler bores spaced axially apart in said body and opening into said body bore, a series of upper tumbler pins having flat lower ends in said upper tumbler bores, springs urging said upper tumbler pins toward said body bore, a plug having a coaxial circular-cylindrical outer surface and disposed in said body bore and rotatable about said axis, means defining a keyway extending axially in said plug, means defining a series of lower tumbler bores in said plug opening into said keyway and in one rotary position of said plug disposed in radial alignment with respective ones of said upper tumbler bores, a series of lower tumbler pins in respective ones of said lower tumbler bores adapted to be engaged by a key in said keyway, and means defining a flat ramp on said plug extending chordally of said plug from an abrupt junction with said circular-cylindrical outer surface thereof toward a location in said keyway radially inward of said outer surface and in the normal plane of an intermediate one of said series of upper tumbler pins.

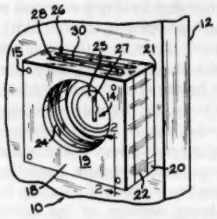
4,107,967
ACCESS-LIMITING APPARATUS

William C. Grabb, 325 Barton Shore Dr., Ann Arbor, Mich. 48105

Filed Dec. 12, 1977, Ser. No. 859,220
Int. Cl.[2] E05B *17/18*
U.S. Cl. 70—427 **11 Claims**

1. Access-limiting apparatus comprising a body having front and rear walls, means forming a longitudinal passageway through said body extending through said front and rear walls, means forming a second passageway through said body ex-

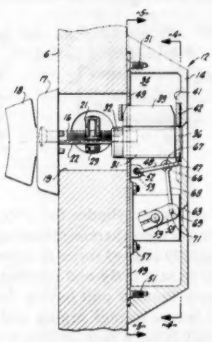
tending transversely of and intersecting said first passageway between said front and rear walls, a lock plate movable in said second passageway to a locked position closing said first passageway, coacting lock means on said body and said lock plate for securing said lock plate in said locked position, and a key plate having lock release means thereon engageable with said lock means to release said lock plate from said locked position.



4,107,968
TALLY LOCK

Ernest L. Schlage, Burlingame, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed May 26, 1977, Ser. No. 800,580
Int. Cl.[2] E05B 39/04
U.S. Cl. 70—436 7 Claims



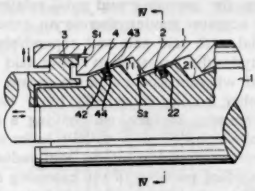
1. A tally lock comprising a frame, a lock cylinder, a lock plug having a key opening in one end thereof and rotatable in said cylinder away from and toward a central position, a plug flange on said plug at the key opening end thereof, means for mounting said lock cylinder on said frame, a counter, means for mounting said counter on said frame, a rotary driver disc having a flat thereon symmetrical in said central position and disposed on and rotatable with said plug flange, a follower mounted on said frame symmetrically with said central position and in the path of rotation of said flat on said disc, and means operated by said follower for actuating said counter.

4,107,969
HOT STRIP COILING MANDREL

Hiroshi Okabe; Noboru Hase, both of Sawara; Hitoshi Asai, Itako, and Teruo Hiramatu, Kashima, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed May 3, 1977, Ser. No. 793,355
Claims priority, application Japan, May 15, 1976, 51-55757; May 15, 1976, 51-55758; Sep. 28, 1976, 51-130094[U]
Int. Cl.[2] B21C 47/30; B65H 75/24
U.S. Cl. 72—148 9 Claims

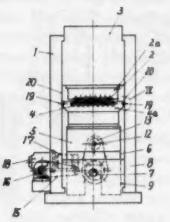
1. A hot strip coiling mandrel having a mechanism for radially expanding and collapsing a drum comprised of a plurality of circumferentially equally divided segments engaged around a core shaft by moving the core shaft or the drum segments axially relative to each other, said mandrel being characterized by buffer means comprising contact blocks and resilient members supporting said blocks resiliently and provided between said core shaft and each of said segments and urging said segments radially outwardly of said mandrel.



4,107,970
MACHINE FOR FLATTENING STRIP METAL

Josef Ihle, Pforzheim, Fed. Rep. of Germany, assignor to Irma Ungerer geb. Dollinger, Pforzheim, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 793,941
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646201
Int. Cl.[2] B21D 1/02
U.S. Cl. 72—165 11 Claims



10. A machine for flattening sheet metal, comprising
a stationary frame,
a stationary set of upper rolls carried by said frame,
a yoke mounted in said frame for adjustment in height,
a set of lower rolls mounted in said yoke adjacent to said upper rolls and adjustable in height relative thereto in unison with said yoke,
adjusting shaft means mounted in said frame for rotation on a horizontal axis,
first motion-transmitting means which are eccentric to said adjusting shaft means and non-rotatably connected thereto, and
second motion-transmitting means connected to said yoke for rotation relative thereto about an axis which is offset from said horizontal axis and engaging said first motion-transmitting means and arranged to adjust said yoke in height in response to a rotation of said first motion-transmitting means.

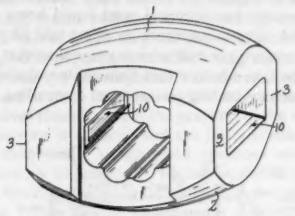
4,107,971
CLUSTER TYPE ROLLING MILL

Siegfried H. Hunke, Thomaston, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Jun. 14, 1977, Ser. No. 806,522
Int. Cl.[2] B21B 31/02
U.S. Cl. 72—237 6 Claims

1. A cluster type rolling mill having a housing comprising an upper part and a lower part, each generally rectangular in plan, four corner posts connecting said upper and lower parts, a roll

cluster including a plurality of upper and lower backing elements, the shape of said upper and lower parts being defined by exterior curves, one in a plane of a backing element axis and



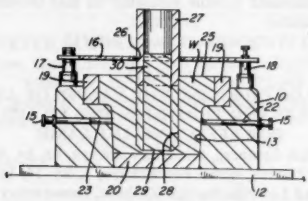
perpendicular to the sides of the housing and another in a plane which is perpendicular to said axis, wherein each part acts as a curved beam, and the highest point of each part occurs at the vertical center axis of the housing.

4,107,972

DIES FOR FORGING AND TREPANNING LARGE DIAMETER COUPLINGS AND METHOD OF FORGING AND TREPANNING COUPLINGS

Wayne A. Martin, Wilkens Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 7, 1977, Ser. No. 849,153
Int. Cl.[2] B21D *28/00*
U.S. Cl. 72—334 **12 Claims**



1. For forging a large diameter coupling, a die including a body having a bore and a counterbore, an annular flange insert received in said counterbore and having an inside diameter larger than the diameter of said bore, and a flat circular spacer received in said bore, said bore and said flange insert being adapted to receive a heated cylindrical workpiece which rests on said spacer, said bore, flange insert and spacer defining a space for contour-forging the workpiece to the outside configuration of a coupling having a flange at one end, said insert and spacer being removable and replaceable with inserts of different size.

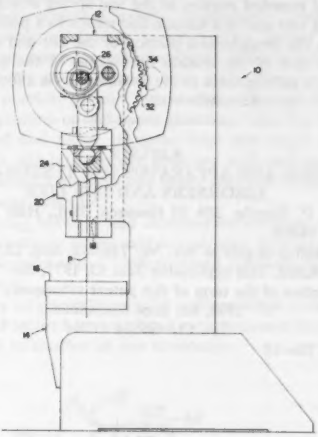
4,107,973

PRESS DRIVE MECHANISM

Paul V. Smejkal, Berwyn, and Robert B. Baranski, Chicago, both of Ill., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 4, 1977, Ser. No. 821,331
Int. Cl.[2] B21J *9/18*
U.S. Cl. 72—450 **33 Claims**

1. A press comprising, frame means, a slide member supported by said frame means for reciprocation along a linear slide path between upper and lower positions, and means to drive said slide member, said drive means including shaft means supported by said frame means for rotation about a shaft axis transverse to said path, said shaft means including first eccentric means rotatable therewith and having a first axis parallel to and offset with respect to said shaft axis, power link means pivotally received on said first eccentric means and having an end spaced from said shaft axis and said first axis, connecting link means pivotally interconnecting said slide member and said end of said power link means, said power link means including second eccentric means having an outer periphery surrounding said shaft axis and having a second axis



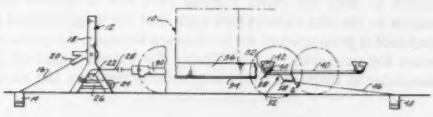
parallel and offset with respect to said shaft axis and said first axis, and rocker link means pivotally received on said outer periphery of said second eccentric means and having an end spaced from said second axis and connected to said frame means for pivotal movement about a third axis parallel to said second axis.

4,107,974

METHOD FOR STRAIGHTENING AUTOMOBILE BODIES

Charles J. Kuhn, 10520 Plainview Ave., Tujunga, Calif. 91042

Filed Mar. 1, 1976, Ser. No. 662,830
Int. Cl.[2] B21D *1/12*
U.S. Cl. 72—457 **4 Claims**



1. A method for straightening an automobile body wherein a pulling force required to straighten the automobile is applied to the automobile and an anchoring device anchors the automobile body against the pulling force, the automobile body being of unitized construction and having a longitudinal axis and a suspension spring assembly which includes a longitudinally extending, elongated rear leaf spring having a front end and a rear end, a bracket extending downward from the automobile body, and means attaching the front end of the leaf spring to the bracket, the spring attaching means being rounded about an axis transverse to said longitudinal axis of the body, the method including the steps of releasably attaching an anchoring device around the rounded portion of the leaf spring attaching means wherein the anchor device includes a hook made from an elongated steel bar of generally rectangular cross-sectional configuration being between about $\frac{3}{4}$ inch to about $\frac{1}{2}$ inch in thickness and being between about 1 inch and about $2\frac{1}{2}$ inches in width, one end portion of said rectangular bar being curved to form a generally C-shaped hook having a generally circularly curved inside bearing surface for being

releasably attached to the rounded portion of said leaf spring attaching means, the bar having a portion thereof extending away from the hook to form an elongated, relatively straightened end portion remote from the hook; extending said straightened portion of the bar toward the rear end of the leaf spring when the hook portion of the bar is releasably engaged with said rounded portion of the leaf spring attaching means; attaching one end of a tension line means to a point of attachment on the straightened portion of the bar and securing an opposite end of the tension line means to the ground; and applying a pulling force to the automobile via a force means to straighten the automobile body.

4,107,975

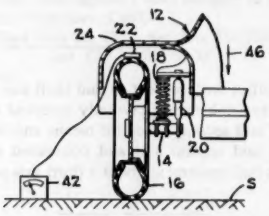
METHOD AND APPARATUS FOR TESTING SHOCK ABSORBERS AND THE LIKE

William P. Cargile, 206 El Granada Blvd., Half Moon Bay, Calif. 94019

Continuation-in-part of Ser. No. 716,632, Aug. 23, 1976, Pat. No. 4,034,596. This application Jun. 13, 1977, Ser. No. 805,988 The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.[2] G01M *17/04*

U.S. Cl. 73—11 **11 Claims**



1. Apparatus for in situ testing of a vehicular shock absorber wherein the shock absorber extends between an axle part of the vehicle and a body part of the vehicle to damp relative movement therebetween comprising transducer means having a reactive element cooperable with one of the parts to form a reactance with the one part that has a magnitude proportional to the distance between said transducer and the one part of the vehicle, means for supporting said transducer immovably with respect to only the other vehicle part and in spaced apart relation to the one vehicle part such that the magnitude of the reactance is proportional to the distance between the parts, and means for measuring and analyzing the output signal of said transducer in response to relative motion between the parts.

4,107,976

METHOD AND APPARATUS FOR DETECTING AND CONTROLLING A VOLATILE SUBSTANCE

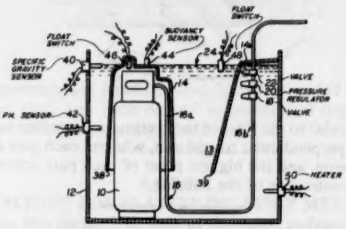
Harold Willids Andersen, and Charles H. Harrison, both of Oyster Bay, N.Y., assignors to H. W. Andersen Products Inc., Oyster Bay, N.Y.

Division of Ser. No. 387,461, Aug. 10, 1973, Pat. No. 3,981,701. This application Apr. 2, 1976, Ser. No. 672,937

Int. Cl.[2] F17C *13/02*; G01M *3/04*

U.S. Cl. 73—52 **10 Claims**

1. The method of managing and detecting leaks in a flammable volatile substance which is used in a sterilization device to which the volative substance is delivered at a controlled delivery pressure, said volatile substance being contained under pressure within a closed storage tank and having delivery means for delivering the volatile substance from the closed storage tank to a pressure control device, comprising the steps of containing said volatile substance under pressure within said storage tank and within at least parts of said delivery means, immersing said storage tank and said parts of said delivery means within a liquid such that any accidental leakage of said volative substance from said storage tank or from said parts of said delivery means passes into said liquid, said liquid being capable of absorbing said leakage of volatile substance and in so doing effecting physicochemical changes in the liquid, utilizing said physicochemical changes in the liquid to actuate sensor means to trigger a warning signal indicating that such accidental leakage has occurred, said liquid being capable of absorbing said volatile substance to effect said physicochemical changes and trigger said warning signal so that corrective action may be taken before said flammable volatile substance escapes to the surrounding atmosphere, controlling the release



of said volatile substance from said delivery means by said pressure control device, maintaining said pressure control device at the temperature of said immersion liquid by immersing the control device in the liquid, and maintaining the temperature of said liquid at a temperature greater than the condensation temperature of said volatile substance such that the volatile substance is prevented from condensing in said delivery means and in said pressure control device, whereby delivery of a condensed volatile substance to said sterilization device is precluded.

4,107,977

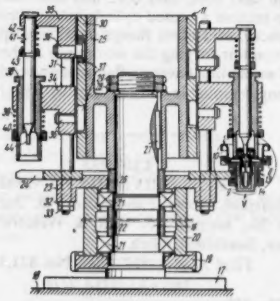
METHOD OF CHECKING THE VALVES OF AEROSOL CONTAINERS FOR TIGHTNESS AND AN APPARATUS FOR EFFECTING THE SAME

Ijun Iosifovich Grinberg, ulitsa Zavodskaya, 4a, kv. 44; Evgeny Kuzmich Zhukov, ulitsa Fevralskaya, 1, kv. 14, both of Klimovsk, and Lev Nikolaevich Koshkin, Samotechny pereulok, 23, kv. 54, Moscow, all of U.S.S.R.

Continuation of Ser. No. 511,463, Oct. 2, 1974, abandoned. This application Aug. 18, 1976, Ser. No. 715,570

Int. Cl.[2] G01M *3/28*

U.S. Cl. 73—45.3 **9 Claims**



1. A leak tester for aerosol valves comprising an endless chain conveyor travelling along a pre-set closed path in a horizontal plane, said conveyor having blind seats for accommodating aerosol valves to be tested, means for introducing said aerosol valves onto said seats, resilient elements on said seats on which said valves are seated, a turnable drum movable along a circular path which coincides in part with the path of the chain conveyor, means mounted on said turnable drum for

travelling therewith and cooperating with said valves for pressing said valves individually against respective resilient elements to form a sealed condition of said valves against said seats so that said resilient elements are deformed, means for opening said valves, cam means operatively coupled to the valve opening means and the valve pressing means first for opening the valves when they are sealed against said seats so that atmospheric pressure is established in said seats beneath said valves whereby the air pressure on the resilient elements is equalized and second for releasing the valve pressure means after the valves closing so that the pressure of the valves on the resilient elements is reduced and the latter elastically tend to return to their initial undeformed positions and carry the valves therewith to establish a suction in the seats below the valves and thereby a pressure differential on the valves tending to hold the valves on the seats, means downstream of said turnable drum for directing a jet of compressed fluid against said valves, said pressure differential being sufficient to cause the intact valves to withstand the jet of compressed fluid applied against the valves, said valves, if defective, permitting leakage of air beneath the seats to diminish the pressure differential and permit dislodging of the valves under the jet of compressed fluid, hopper means for receiving dislodged faulty valves, means downstream of said hopper means for re-opening said intact valves to permit atmospheric air to flow into said seats and cancel the pressure differential, means for removing the valves whose pressure differential has been cancelled, a second turnable drum movable along a circular path coinciding in part with a portion of the path of the chain conveyor downstream of the said hopper means; said means for re-opening the intact valves being mounted on the second drum.

4,107,978

DUROMETER ACCORDING TO ROCKWELL SYSTEM

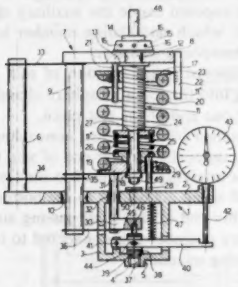
Alfred Ernst, Casa Carolina, Curio Ticino, Switzerland

Filed Feb. 28, 1977, Ser. No. 772,483

Claims priority, application Switzerland, Mar. 1, 1976, 2526/76; Mar. 1, 1976, 2527/76

Int. Cl.² G01N *3/44*

U.S. Cl. 73—83 **12 Claims**



8. An apparatus for testing the hardness of a workpiece, said apparatus comprising:

lower structure having a substantially planar surface defining a reference plane;

a penetrator displaceable along a penetrator axis relative to said lower structure between an outer position projecting relatively far from said plane and an inner position generally flush with said plane;

a preload spring between said penetrator and said lower structure urging said penetrator into said outer position with a relatively small preload force;

upper structure adapted to receive an applied load force directed axially toward said lower structure;

means between said upper and lower structures for axial displacement of said upper structure relative to said lower structure through a relatively long axial distance between an upper rest position relatively far from said lower structure and a lower position abutting said lower structure;

an abutment carried on and axially displaceable with said upper structure;

intermediate structure axially displaceable toward said upper structure from a lower position resting on said abutment, said intermediate structure being spaced axially a relatively short distance from said penetrator in said lower position of said intermediate structure and said upper position of said upper structure, whereby displacement of said upper structure from said upper position engages said intermediate structure with said penetrator and thereafter engages said upper structure directly with said lower structure;

a load spring between said intermediate structure and said upper structure urging said intermediate structure against said abutment with a predetermined relatively large load force; and

a plurality of generally parallel resilient strips each having one end secured to one of said structures and another end secured to another of said structures.

4,107,979

METHOD AND DEVICE FOR MEASUREMENT OF ENVIRONMENTAL STRESS CRACKING

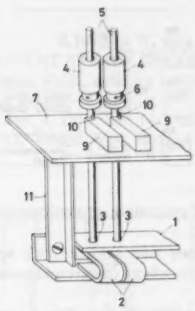
Shigeru Saeda, and Yukinori Suzaka, both of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Mar. 8, 1977, Ser. No. 775,560

Claims priority, application Japan, Mar. 11, 1976, 51-25586

Int. Cl.² G01N *3/00, 3/20*

U.S. Cl. 73—88 R **3 Claims**



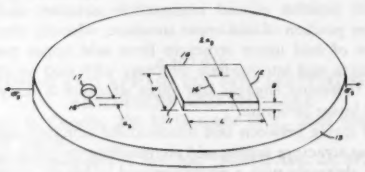
3. A device for the measurement of environmental stress cracking, which comprises means for holding a test piece in a prestressed deformed position, where said holding means is shaped such that a known prestress is placed on said test piece resulting from a deformation of said test piece required in order for said test piece to be inserted in said holding means, said means incorporating an opening for communication between an inner space thereof and the exterior, loading means consisting of a supporting shaft penetrated through said opening in said test piece holding means and a weight fastened to said shaft, and means for sensing a displacement of said loading means.

4,107,980

ASSESSMENT OF FLAW GROWTH POTENTIAL IN STRUCTURAL COMPONENTS

Robert L. Crane, Kettering; Alten F. Grandt, Jr., Dayton, and Joseph P. Gallagher, Bellbrook, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 7, 1977, Ser. No. 804,483
Int. Cl.[2] G01B *5/30*
U.S. Cl. 73—88 R **12 Claims**



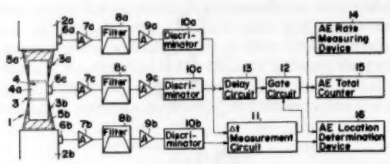
7. The combination of a crack growth gage attached to a structural component for assessing damage accumulation in the structural component comprising a fatigued metal strip having a flaw therein of a predetermined initial length greater than an assumed or measured length of a flaw in the structural component; and means for attaching ends of the metal strip to the structural component with its underside between the attaching means in unobstructed contact with the structural component.

4,107,981

METHOD OF ESTIMATING GROUND PRESSURE

Tadashi Kanagawa, Kashiwa, and Hiroyasu Nakasa, Tokyo, both of Japan, assignors to Central Research Institute of Electric Power Industry, Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,598
Claims priority, application Japan, Sep. 22, 1976, 51-113938
Int. Cl.[2] G01N *3/06*
U.S. Cl. 73—88 E **5 Claims**



1. A method of estimating ground pressure comprising the steps of:

removing at least one sample rock specimen from the ground location where the ground pressure is to be determined;

applying a load externally to said rock specimen, and continuously increasing said applied load over a given period of time;

counting the number of acoustic emissions produced from the interior of said rock specimen to which the load is applied during said given period of time;

determining the relationship between the number of acoustic emissions and the time period of measurement and determining the point of inflection of said acoustic emissions during said time period; and

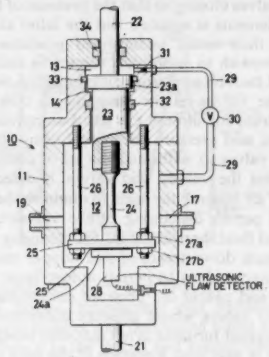
comparing the time of said point of inflection with the time of the load applied and determining the load applied at the time of inflection, whereby the hysteretic maximum stress of said rock specimen is determined.

4,107,982

VESSEL FOR ATMOSPHERE FOR USE WITH MATERIAL TESTING DEVICE

Murao Mitsui; Kiyoshi Yokogawa, and Seiji Fukuyama, all of Kure, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,361
Claims priority, application Japan, Mar. 29, 1976, 51-34779
Int. Cl.[2] G01N *3/08*
U.S. Cl. 73—95 **6 Claims**



1. A vessel for retaining an atmosphere in which a test piece is tested, comprising in combination:

(a) a casing defining an auxiliary chamber in an upper portion and a test atmosphere chamber in a lower portion, the auxiliary chamber and the test atmosphere chamber being separated by an airtight chamber,

(b) means for providing intercommunication between said test atmosphere chamber and said auxiliary chamber,

(c) a sliding member having a head portion thereof inside the auxiliary chamber and a bottom portion protruding airtightly into said test atmosphere chamber,

(d) means for equalizing the pressure to which the sliding member is exposed inside the auxiliary chamber and the pressure to which said sliding member is exposed inside the test atmosphere chamber,

(e) means disposed in the portion of said sliding member protruding into the test atmosphere chamber and adapted to support one end of the test piece,

(f) a stay fastened inside the test atmosphere chamber and adapted to support the other end of said test piece, and

(g) a shaft for applying a test load to the test piece, one end of the shaft being connected to the bottom of said casing and the other end of said shaft passing airtightly through the auxiliary chamber and connected to the head portion of said sliding member.

4,107,983

METHOD AND MACHINE FOR DETECTING AND CORRECTING TENSION OF SAW BLADES

Chester H. Dawson, Danbury, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Aug. 8, 1977, Ser. No. 822,418
Int. Cl.[2] G01N *3/20*
U.S. Cl. 73—100 **7 Claims**

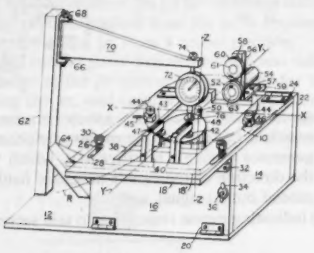
7. A machine for detecting the tension in a saw blade, comprising:

means for supporting the blade horizontally at least at two points on opposite sides of the center of the blade, said points defining a first diametral axis of the blade;

means for resisting upward movement of the blade at at least two further points on opposite sides of the center of the blade, said further points defining a second diametral axis

of the blade circumferentially spaced from said first diametral axis;

means for elastically deflecting the blade by pressing said supporting means and said resisting means in opposite directions along a major rotational axis of the blade normal to said first and second diametral axes, thereby to deflect the blade into a saddle form with an upper surface of the blade being concave along said first diametral axis and tending toward upward convexity along said second



diametral axis, said tendency toward upward convexity being offset by and to the extent of any tendency of the central portion of the horizontally-supported blade to drop through in the presence of a decreasing level of tension from the periphery of the blade toward its center;

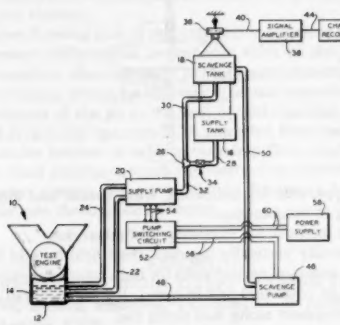
and means for detecting any convexity of a portion of said upper surface of the blade lying along said second diametral axis, as an indication of the relative levels of tension existing diametrally across the blade.

4,107,984

SYSTEM FOR MAINTAINING LEVEL OF OIL IN ENGINE

Ronald James Unger, Richmond, and John Gilbert Spoonamore, Hagerstown, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Apr. 11, 1977, Ser. No. 786,632
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—113 **9 Claims**



8. A system for delivering a lubricating fluid to an internal combustion engine under test comprising:

a first fluid supply tank;

a second fluid supply tank;

a load cell, said first and second tank suspended from said load cell with said second tank positioned above said first tank, said load cell generating a signal representing the weight of the fluid in said tanks;

a first pump having a first inlet in fluid communication with said first and second tanks, a second inlet in fluid communication with the engine above a predetermined fluid level and an outlet in fluid communication with the engine at the predetermined fluid level, said first pump for supplying fluid to the engine from said tanks when the fluid in the engine is below the predetermined level;

valve means blocking the flow of fluid from the first tank upon the presence of fluid in said second tank;

a second pump for delivering fluid from the engine to said second tank when the fluid in the engine is above the predetermined level; and

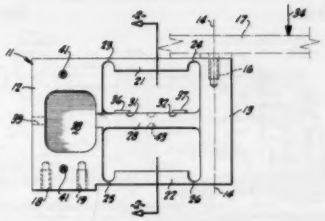
means responsive to said load cell signal for determining the rate of consumption of the fluid.

4,107,985

LOAD CELL

Thomas R. Sommer, Sebastopol, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Filed Sep. 10, 1976, Ser. No. 721,981
Int. Cl.[2] G01L *1/22;* **G01G** *3/14, 3/08*
U.S. Cl. 73—141 A **2 Claims**



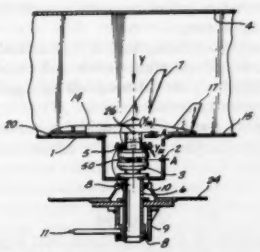
1. In a load cell: a base, a load arm spaced from the base for receiving a load applied in an axial direction, a pair of generally parallel arms with flexures interconnecting the base and load arm and constraining the load arm for movement in the axial direction, a substantially rigid beam affixed to the load arm and base and having a region of reduced thickness toward the center thereof, and stress responsive means mounted on the beam and spaced longitudinally apart between the region of reduced thickness and the ends of the beam for providing an output signal corresponding to the load.

4,107,986

FIVE COMPONENT STRAIN GAUGE BALANCE

Roy L. Jones, Anaheim, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 4, 1977, Ser. No. 784,353
Int. Cl.[2] G01M *9/00;* **G01L** *5/16*
U.S. Cl. 73—147 **8 Claims**



3. A balance for measuring forces and moments exerted on an aircraft model in a wind tunnel wherein half of a model is mounted with the wing in the vertical plane, and with the fuselage half in close proximity to the wind tunnel floor and attached to the top of said balance, comprising,

an upper member rigidly attached to said model,

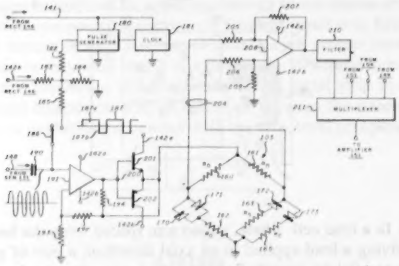
a lower member attached to the wind tunnel structure,
a forward beam, an aft beam and two side beams arranged in a diamond pattern in relation to the direction of air flow in said wind tunnel rigidly connecting said upper and lower members,
at least one strain gauge attached to each beam for measuring the strain of each beam, and
at least one flexure forward of, and at least one flexure aft of, each side beam, each flexure rigidly attached to said upper and lower members.

4,107,987

GEOTHERMAL WELL PUMP PERFORMANCE SENSING SYSTEM AND MONITOR THEREFOR

Kenneth W. Robbins, Wilmington, and Gerald F. Ross, Lexington, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,220
Int. Cl.[2] E21B *47/06*
U.S. Cl. 73—151 **19 Claims**



1. In apparatus including moving means at a location within a borehole remote from the earth's surface for performing useful work with respect to a medium at said location:
first transducer means having first and second relatively movable parts at least one of said parts being mechanically coupled to said moving means for generating a first electrical signal characteristic of motion of said moving means,
multiple-arm bridge means having input means excited by said first electrical signal and first and second discrete output means,
said multiple-arm bridge means having one arm including first and second circuits in parallel,
said first circuit including first resistor means responsive to a characteristic of said medium and first diode means,
said second circuit including second resistor means stable with respect to said characteristic and second diode means poled oppositely with respect to said first diode means,
transmitter means utilizing said first electrical signal as enabling electrical operating power and responsive to said discrete output means for transmitting signals representative of said characteristic, and
receiver means responsive to said transmitter means and adapted for exciting utilization means exterior of said borehole.

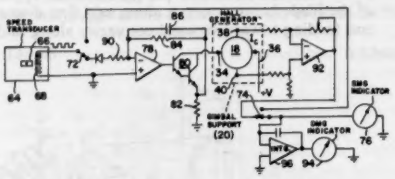
4,107,988

NAVIGATION AID FOR SAILING VESSELS

Lawrence M. Polsky, 529 French Rd., Rochester, N.Y. 14618

Filed Oct. 3, 1977, Ser. No. 839,061
Int. Cl.[2] G01C *21/10*
U.S. Cl. 73—178 R **13 Claims**

1. Navigation apparatus for indicating the actual progress of a sailing vessel towards a selected position, said apparatus comprising
(a) means for detecting the speed of the vessel and providing a first output signal proportional thereto,
(b) means responsive to the earth's magnetic field and to said first output signal and rotatable in azimuth for generating a second output signal which is proportional to the actual



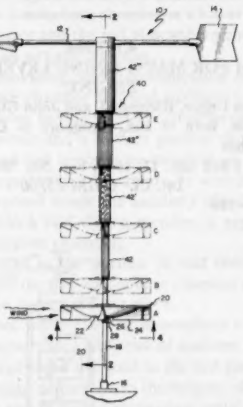
speed of said vessel along a direct course to said selected position, said generating means comprising a Hall effect generator having a sensitive axis, which when aligned in the direction of the earth's magnetic field maximizes said second output signal, and
(c) indicating means responsive to said second output signal.

4,107,989

DECORATIVE WIND VELOCITY AND DIRECTIONAL INDICATOR

George Peters, 313 Lydia La., Cheektowaga, N.Y. 14225

Filed Jul. 20, 1977, Ser. No. 817,137
Int. Cl.[2] G01W *1/02*
U.S. Cl. 73—189 **18 Claims**



1. An apparatus for indicating wind speed, said apparatus comprising in combination:
a. a base member for mounting said apparatus;
b. a generally vertically disposed shaft held by said base;
c. a disk mounted on said shaft for both rotational movement about its rotational axis of symmetry and generally vertical movement along said shaft; and
d. means mounted on said shaft for adding increments of weight to said disk at different vertical elevations of said disk up said shaft.

4,107,990

FLUIDIC FLOW AND VELOCITY SENSOR

Carl G. Ringwall, Scotia, N.Y., assignor to General Electric Company, Wilmington, Mass.

Filed Nov. 2, 1976, Ser. No. 738,067
Int. Cl.[2] G01F *1/20*
U.S. Cl. 73—194 B **9 Claims**

1. A flowmeter having inlet and outlet passages adapted to

be connected in a fluid conduit for sensing fluid flow through said conduit comprising:

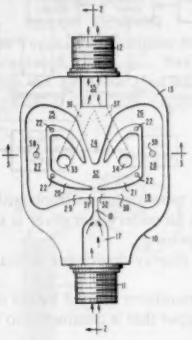
a. a housing having wall portions forming a jet interaction chamber,

b. fluid accelerating means connected to the inlet passage and arranged to generate and direct a fluid jet through the interaction chamber,

c. venting conduit means leading from the chamber to the outlet passage,

d. a pair of fluid receiver means disposed in said interaction chamber on opposite sides of the jet for receiving differentially variable portions of fluid from the jet in response to lateral deflection of the jet from a center position,

e. means forming control ports disposed on opposite sides of the jet upstream of the jet interaction chamber for laterally deflecting the jet, said control ports being positioned closely adjacent to the base of said fluid jet to provide lateral deflection by virtue of the differential pressure



existing on opposite sides of the jet, the area of said ports being such that a small percentage of the total fluid jet passing through the interaction chamber passes through said ports, whereby the input and output fluid flow resistance varies proportionally to the fluid velocity,

f. feedback conduit means interconnecting the receiver means and the control ports to cause oscillation of the jet by application on a negative feedback differential pressure signal thereto,

g. means forming part of said interaction chamber to prevent pressure differentials on opposite sides of the jet in the interaction chamber due to fluid entrainment, thereby preventing lateral jet deflection in said chamber and attachment of the jet to the wall of said chamber, whereby the flowmeter operates in an extended flow range which includes laminar as well as turbulent flow conditions for the fluid passing through the interaction chamber, and

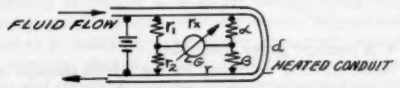
h. means sensing the jet oscillation frequency to indicate flow rate through said conduit.

4,107,991

RESISTANCE BRIDGE-TYPE FLOWMETER

James M. Benson, Hampton, Va., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Jul. 20, 1977, Ser. No. 817,522
Int. Cl.[2] G01F *1/68*
U.S. Cl. 73—204 **9 Claims**



1. A fluid flowmeter comprising:

an electrically and thermally conductive conduit, said conduit having an electrical resistance which varies as a function of temperature;

means for passing electrical current through said conduit thereby heating it;

a resistance bridge joined to said conduit at spaced points along the conduit, said points defining at least one conduit segment;

means for passing fluid through the conduit to vary the temperature and resistance of said segment so as to affect the balance of said bridge; and

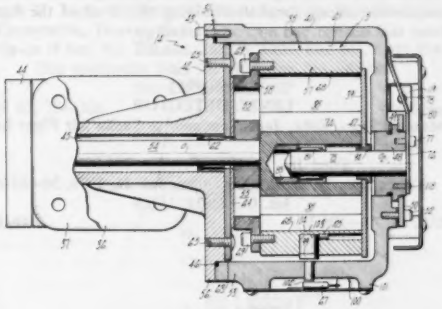
a meter operatively associated with the bridge for displaying the condition of balance of said bridge.

4,107,992

FLUID METER

Coates F. Bateman, West Hartford, and Louis Soltanoff, Stamford, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Feb. 4, 1977, Ser. No. 765,685
Int. Cl.[2] G01F *3/06*
U.S. Cl. 73—260 **15 Claims**

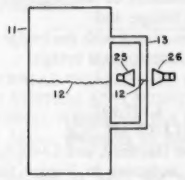


1. A positive displacement rotary fluid meter comprising a housing, an enclosed rotor assembly rotatably mounted within the housing having an outer ring rotatably mounted about a first axis, an inner rotor rotatably mounted within the outer ring about an axis parallel and eccentric to the axis of the outer ring and with an annular chamber therebetween, a pair of axially spaced transverse end members for the annular chamber, and a plurality of generally radially extending and angularly spaced vanes connected to the outer ring and inner rotor and dividing the annular chamber into a plurality of separate positive displacement chambers which expand and contract during rotation of the rotor assembly, the housing having a transverse sidewall in flush engagement with one of the transverse end members of the rotor assembly and separate inlet and outlet passageways with respective generally diametrically opposed inlet and outlet ports in said one sidewall, said one transverse end member of the rotor assembly having a plurality of axial openings for the plurality of positive displacement chambers respectively, each in communication with the respective positive displacement chamber and in alternating communication with the inlet and outlet ports as the respective positive displacement chamber expands and contracts respectively during rotation of the rotor assembly, and magnetically operated pulse generator means comprising fixed magnetically responsive pickup means operative to generate an electrical pulse, and a plurality of pickup operating means mounted on the rotor assembly for operating the pickup means to generate an electrical pulse for each predetermined increment of rotation of the rotor assembly, the rotor assembly being axially shiftable to vary its axial force against said transverse housing sidewall and the housing having fluid therein externally of the enclosed rotor assembly and operative to bias the rotor assembly axially against said transverse housing sidewall.

4,107,993
METHOD AND APPARATUS FOR LEVEL MEASUREMENT USING MICROWAVES

Thomas J. Shuff, Dickinson, and Robert W. Sims, Pasadena, both of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,386
Int. Cl.[2] G01G *23/28*
U.S. Cl. 73—290 R **7 Claims**

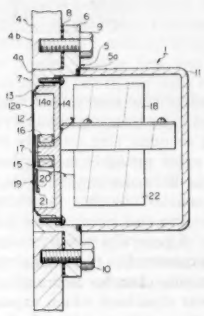


1. The method of continuously indicating the level of a liquid in a vessel comprising: generating microwaves, directing the microwaves through said vessel, measuring the unabsorbed microwave energy, and determining the level of the liquid from said unabsorbed microwave energy.

4,107,994
LEVEL DETECTOR

Masaaki Sogo, Kobe, Japan, assignor to Sanko Air Plant Ltd., Osaka, Japan

Filed Jul. 13, 1976, Ser. No. 704,807
Claims priority, application Japan, Jul. 21, 1975, 50-88340
Int. Cl.[2] G01F *23/26*
U.S. Cl. 73—290 V **7 Claims**



1. A level detector for use in detecting whether the level of contents in a container has reached a predetermined level, said detector comprising:

coil means for producing an electromagnetic force;

driving means for intermittently supplying pulse signals to said coil;

vibrating plate means having a surface substantially flush with the surface of the inner wall of the container, said coil means in close proximity to said vibrating plate means so that said plate means is intermittently vibrated by said electromagnetic force, the vibrating condition of said plate means changing depending on whether or not said contents contact said plate means;

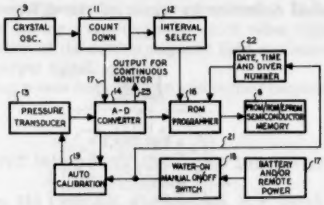
mechanical vibrating-electric converter means for converting the vibrations of said plate means into an electric signal with changes on the attenuation time of the intermittent vibrations of said plate means, said converter means attached to said vibrating plate means having one end attached to said vibrating plate means and means secured to the other ends of the piezo-electric element to produce a distortion effect to said piezo-electric element under inertial influence of said means; and

detecting means for detecting changes in said electric signal caused by changes in said attenuation time, to thereby determine if the level of the container contents has reached said predetermined level.

4,107,995
RECORDER FOR DECOMPRESSION DATA

James Raymond Ligman, 93 Manzanita Ln., Santa Barbara, Calif. 93105, and Richard Fred Jones, 335 Rosemead, Santa Barbara, Calif. 93110

Filed Sep. 13, 1976, Ser. No. 722,710
Int. Cl.[2] G01F *23/18;* G01L *9/00*
U.S. Cl. 73—300 **16 Claims**



1. A system for monitoring on shipboard and recording the pressure to which an underwater diver is subjected as a function of time, comprising:

(a) a shipboard display device for indicating time and pressure;

(b) a pressure transducer carried by the diver and having an electronic output that is conducted to the shipboard pressure display;

(c) a clock having a periodic electronic output located at one of said diver or shipboard locations and connected to said shipboard time display;

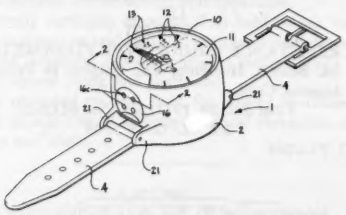
(d) and an electronic recorder located at one of said diver or shipboard locations and connected to said pressure transducer and said clock to record periodically the instantaneous pressure,

whereby the instantaneous pressure and time are observed on shipboard and a record of pressure versus time is obtained on the recorder for any selected period of time.

4,107,996
PRESSURE GAUGE

Ashley J. Hollingsworth, Atherton, and Ralph B. Shamlian, San Francisco, both of Calif., assignors to Farallon Industries, Inc., Belmont, Calif.

Filed Nov. 28, 1975, Ser. No. 636,045
Int. Cl.[2] G01F *23/14;* G01L *7/08*
U.S. Cl. 73—300 **10 Claims**



1. A pressure gauge comprising:

means forming a housing having a bore through one wall and including a compressible medium;

a pointing means;

means forming a faceplate for bearing indicia;

a rack-and-pinion gear assembly having a rack and a gear for

rotating said pointing means relative to said indicia as said rack is moved;

means forming a flexible rolling diaphragm having no appreciable spring gradient within a predetermined range of stroke, said diaphragm being disposed to lie in contact with one end of said rack in said bore and being movable under the influence of a pressure differential between the interior of said housing and ambient pressure for moving said rack with no appreciable stretching of the material of which said diaphragm is made throughout said stroke;

means for sealing said diaphragm in said bore; and

means for returning said rack and said pointing means to an initial position upon the removal of said pressure differential from said diaphragm.

4,107,997

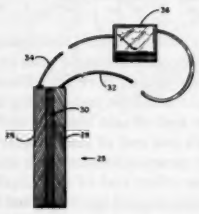
ALLOY SENSOR

Alvin A. Snaper, Las Vegas, Nev., assignor to Advanced Patent Technology, Incorporated, Las Vegas, Nev.

Filed Sep. 15, 1975, Ser. No. 613,528

Int. Cl.[2] G01F *23/24*; C22C *11/06, 30/04*

U.S. Cl. 73—304 R **8 Claims**



3. A composition comprising 20–45% each by weight lead, tin and zinc and up to about 0.1% by weight copper and up to 0.1% by weight tellurium.

4. The composition of claim 3 wherein said amounts of copper and tellurium are between about 0.01 and 0.1%.

6. A method of measuring the level of an aqueous composition comprising exposing said composition to an electrode of an alloy of claim 4, detecting the magnitude of current passing from said electrode and determining the surface area of said electrode exposed to said composition which is directly proportional to said current magnitude.

4,107,998

PETROL TANK GAUGES

Kenneth James Taylor, Pascoe Vale South, Australia, assignor to Stewart-Warner Corporation, Chicago, Ill.

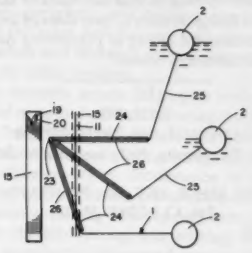
Filed Apr. 30, 1976, Ser. No. 681,813

Claims priority, application Australia, Apr. 30, 1975, PC1412; Mar. 29, 1976, 12452/76

Int. Cl.[2] G01F *23/10*

U.S. Cl. 73—313 **8 Claims**

1. A sender device adapted for use in a system for indicating the amount or level of a liquid in a vessel with a meter which is non-linearly responsive to a sender current, comprising; substantially straight elongate resistance member adapted to be connected to an indicator, an elongated substantially straight contact member pivotally mounted about an axis closely spaced to said resistance member, said contact member being movable in overlapping relation and in sliding engagement with said resistance member to provide a resistance which varies in accordance with a non-linear function of contact member movement, said contact member being connected to a float member by means of a curved or bent float arm extending



from the end of the contact member opposite the pivot axis of the contact member.

4,107,999

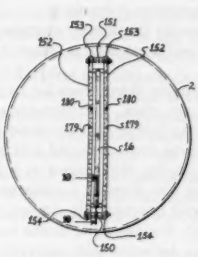
AUTOMATIC OIL LEVEL MAINTAINING SYSTEM

James R. Lang, Littleton, Colo., assignor to The Mechanex Corporation, Denver, Colo.

Division of Ser. No. 709,441, Jul. 28, 1976, Pat. No. 4,091,894. This application May 31, 1977, Ser. No. 801,590

Int. Cl.[2] G01F *23/02*

U.S. Cl. 73—326 **4 Claims**



1. In a system for maintaining a desired level of oil in the crankcase of an engine; said system having a reservoir for containing oil, the improvement comprising;

a first connective member in fluid flow communication with a lower portion of a wall of said reservoir;

a second connective member in fluid flow communication with an upper portion of said wall of said reservoir;

a breakable, elongated, liquid level indicating means in fluid flow communication with each said first and said second connective member for indicating visually the amount of oil in said reservoir;

each said first and second connective member having a first side substantially normal to a surface of said reservoir wall and a second side substantially normal to said surface of said reservoir wall, each said first side and said second side of each of said connective members being substantially parallel to said liquid level indicating means;

an opening through each of said connective members from said first side to said second side; each of said openings being out of fluid flow communication with said reservoir;

a rigid guard member extending from said first side of said first connective member to said first side of said second connective member and a rigid guard member extending from said second side of said first connective member to said second side of said second connective member;

each of said guard members being shaped in cross-section so as to increase the ability to withstand impact without deformation and having an opening at each of two ends; and

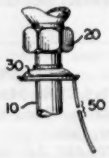
attachment means passing through each of said openings in each of said guard members and through said opening in each of said connective members for rigidly attaching a guard member to each of said two sides of said connective members for being on each of two sides of said liquid level indicating means for aiding in preventing damage to said liquid level indicating means.

4,108,000

GAUGE GLASS PROTECTOR

Orlin R. Norris, Parsippany, N.J., assignor to JeNor, Morristown, N.J.

Filed May 5, 1977, Ser. No. 793,994
Int. Cl.[2] G01F *23/02*
U.S. Cl. 73—328 **7 Claims**



1. A gauge glass protector apparatus for protecting the vertical gauge glass on a boiler type of liquid containing pressure vessel, said apparatus comprising:

a grommet means for frictionally engaging said gauge glass and holding said apparatus in place against said gauge glass;

a downwardly sloping skirt means for directing liquid away from said gauge glass, said downwardly sloping skirt means being attached to said grommet means;

an upwardly sloping rim connected around the edge of said downwardly sloping skirt means at a juncture, said upwardly sloping rim forming a collector trough between said rim and said downwardly sloping skirt means; and

a collector trough drainage hole means located substantially at the juncture between said upwardly sloping rim and said dowardly sloping skirt means,

wherein liquid travelling down said vertical glass gauge impinges upon said grommet means and is carried away from the area of said glass gauge by said downwardly sloping skirt means and into said collector though at which location said liquid harmlessly passes through said trough drainage hole means.

4,108,001

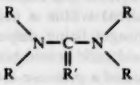
UREA COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Wilkins Township, Allegheny County, and David C. Phillips, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 23, 1976, Ser. No. 726,039
Int. Cl.[2] C09K *3/00;* **G01K** *3/00, 11/00;* **C08K** *5/21;* **C08L** *63/00*
U.S. Cl. 73—339 R **30 Claims**

1. A composition curable at room temperature comprising at least one urea compound and a solution of a room temperature, air-dryable epoxy resinous carrier stable at 60° C when cured, and unreactive with said urea compound, said urea compound being selected from the group consisting of t-butylurea, hydroxyurea, n-butylurea, sym-diethylurea, 1,3-dimethylurea, ethylurea, phenylurea, thiourea, and urea.

13. A thermal detection system for electrical apparatus cooled by a gas stream, comprising a thermoparticulating coating on a portion of said electrical apparatus exposed to said gas stream and a monitor for detecting the presence of thermoparticulated particles in said gas stream, said coating comprising a solid layer of a room temperature, air-dried epoxy or polyester resinous carrier containing a urea compound having the general formula



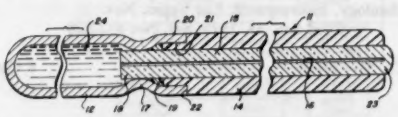
where each R is independently selected from hydrogen, hydroxyl, and alkyl to C_{20}, and R′ is oxygen or sulfur.

4,108,002

DISPOSABLE THERMOMETER

Charles L. Rowe, 787 E. Illinois Rd., Lake Forest, Ill. 60045, and Ronald A. Lewis, 1085 Barnard Dr., Buffalo Grove, Ill. 60090

Filed Dec. 16, 1976, Ser. No. 751,474
Int. Cl.[2] G01K *5/08, 5/22*
U.S. Cl. 73—371 **17 Claims**



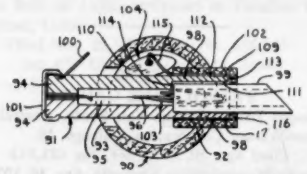
1. A throwaway thermometer comprising: an elongated element formed of a molded synthetic resin and having an axial bore; a layer of glass in said bore for effectively precluding gaseous diffusion into said bore and defining an inner capillary bore; means at one end of said element defining a reservoir communicating with one end of said capillary bore; temperature indicating scale means associated with said element; means sealingly closing the other end of said capillary bore at the other end of the element, said layer of glass being outwardly exposed at said other end of the element; and an indicator liquid in said reservoir and capillary bore under a preselected effectively maintained vacuum pressure.

4,108,003

DEVICE FOR OBTAINING A SAMPLE OF LIQUID

Robert F. McDevitt, P.O. Box 551, Ogden Dunes, Portage, Ind. 46368

Division of Ser. No. 720,697, Sep. 7, 1976, which is a continuation of Ser. No. 565,396, Apr. 7, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,709
Int. Cl.[2] G01N *1/12*
U.S. Cl. 73—425.4 R **15 Claims**



1. A device for obtaining a sample of liquid from a supply thereof, said device comprising a pair of elongated half sections, each of said sections being provided with an enlarged portion provided with a recess and a smaller channel portion, first means and second means respectively securing said enlarged portions and said channel portions together whereby said recesses and said channel portions respectively form a chamber and an elongated opening, a tube having an inner extremity secured in said opening and an outer extremity provided with an entrance for a liquid for flow into said chamber via said tube, and manipulatible means having a portion interposed between at least one of said channel portions and said

second means whereby to facilitate their separation after a sample is received by the device.

4,108,004

SELF-PROPELLED PIPE INSPECTING APPARATUS

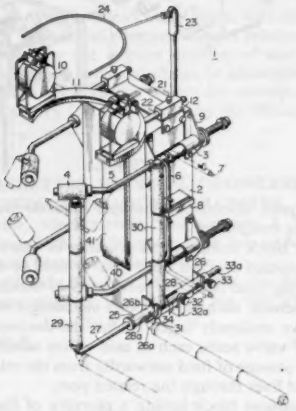
Osamu Murakami, Tokyo, Japan, assignor to Kett Electric Laboratory, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 831,020

Claims priority, application Japan, Sep. 13, 1976, 51-123093[U]

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—432 R **19 Claims**



1. A self-propelled pipe inspecting apparatus comprising (a) fault detecting means, (b) pipe cramping means, and (c) a mobile carriage, and characterized in that (a) said cramping means include at least two arms extending outwardly of said mobile carriage; the outer ends of said arms being bent at a certain angle to the axis of respective arms; said bent ends of said arms carrying rollers engageable with a pipe to be inspected; the other ends of said arms being secured to said mobile carriage so that said ends are movable along and rotatable around the longitudinal axes of respective arms; and said arms being biased by resilient means so as to retract said rollers toward said mobile carriage, and in that (b) said mobile carriage has an elastic running surface; a pipe to be inspected being held between said biased rollers of said cramping means and said resilient running surface; whereby said mobile carriage can run along said pipe in the lengthwise direction of the latter.

4,108,005

VEHICLE DECELERATION SENSING DEVICE

Claes Gustav Erik Yngve Tisell, Strangnäs; Lärs-Göran Svensson, Upsala; Gustav Sven Erik Karlstedt; Gustav Yngve Thorstensson, both of Sollentuna, and John Fredrik Alf Hartmann, Djursholm, all of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Apr. 21, 1977, Ser. No. 789,650

Int. Cl.[2] G01P *15/02*; B60R *21/02*

U.S. Cl. 73—514 **1 Claim**

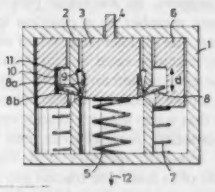
1. A vehicle carried device for sensing and providing an indication when the duration and magnitude of vehicle deceleration exceed predetermined values comprising:

a first mass body (**6**) arranged to be displaced in a first direction (**12**) as the result of an occurring deceleration of a certain magnitude of the vehicle;

a second mass body (**3, 4**) with the ability to be displaced in said direction as the result of an occurring deceleration of the vehicle;

blocking member means (**8**) movable into a predetermined stable first position for preventing displacement of said second mass body in said direction, said blocking member means comprising a cup spring with a cup part (**8*b***) having an inner periphery and locking tongues (**8*a***) disposed around the inner periphery to lock the second mass body (**3, 4**) when said blocking member means is in said predetermined stable position;

actuating member means (**11**) operatively associated with said first mass body for transferring the blocking member means from said first position into second position as a result of the first mass body being displaced a predetermined distance (*d*) by deceleration of the vehicle, said actuating member means transferring said blocking member means by moving said cup part from a first to a second position thereby freeing said locking tongues from said second mass body, the second mass body being displaceable in said direction by deceleration of the vehicle when said blocking member means is in said second position, the displacement of said second mass body providing an indication that the duration and magnitude of the deceleration of the vehicle exceed predetermined values;



rectilinear guide means (**2**) for guiding the movement of said first mass body and said second mass body; a first spring (**7**) operatively associated with said first mass body (**6**), said first mass body being displaceable in said direction (**12**) against the action of said first spring only when the vehicle is given a deceleration of a predetermined magnitude; and

a second spring (**5**) operatively associated with said second mass body (**3, 4**), said second mass body being displaceable in said direction (**12**) against the action of said second spring.

4,108,006

ACCELEROMETERS

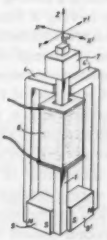
Derek Oscar Walter, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Mar. 25, 1977, Ser. No. 781,452

Claims priority, application United Kingdom, Mar. 30, 1976, 12747/76

Int. Cl.[2] G01P *15/08*

U.S. Cl. 73—517 R **4 Claims**



1. An accelerometer for detecting or measuring accelerations includng an elongate member which is caused to vibrate

when the accelerometer is subjected to an acceleration above a threshold value wherein the member is capable of vibrating in more than one plane and, in vibrating, causes a change to occur in a physical parameter of the accelerometer which is other than a dimensional change due to distortion, said member having a cross-sectional shape such that it has characteristic but different frequencies of vibration in two planes at right angles to one another, the vibrations of said member in two given planes causing recognisably different changes to occur in the said physical parameter which changes are characteristic of vibrations in the said two given planes, said elongate member being supported at one end thereof and the accelerometer also including two magnets or magnetisable elements disposed substantially at right angles to each other in the region of the support and in the two given planes, a pole piece associated with each magnet or magnetisable element and terminating at a face confronting the member across a spacial gap at a position remote from the support, an electrical pickup coil disposed around the elongate member at a position intermediate the support and the gap, the coil serving, when energised to produce two magnetic circuits, each circuit passing through the member, across the appropriate air gap, to a magnetic/magnetisable element via a pole piece, the construction of the accelerometer being such that when subject to an acceleration parallel to or having a component parallel to at least one of the two given planes, the elongate member will vibrate causing a change in the extent of at least one spacial gap and a voltage at terminals of the pick-up coil as a result of a change in flux linkages with the turns of the pick-up coil due to changes in flux of the magnetic circuits.

4,108,007

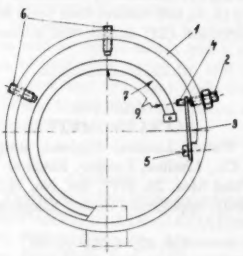
MANOMETERS WITH MEASUREMENT RANGE MULTIPLICATION

Kurt Neubeck, Miltenberg, Main; Karl-Heinz Schwing, Amorbach, and Kurt Klein, Röllfeld, all of Fed. Rep. of Germany, assignors to Alexander Wiegand GmbH u. Co., Armaturen- u. Manometeneabrik, Klingenber, Fed. Rep. of Germany

Filed May 20, 1977, Ser. No. 798,827

Int. Cl.[2] G01L *7/04*

U.S. Cl. 73—732 **4 Claims**



2. A manometer comprising a casing, a tube spring metering element mounted therein having a fixed end and a free end, first means responsive to a predetermined degree of expansion movement of said element to change the effective spring rate thereof so that a unit of subsequent expansion movement indicates an increased rate of increase of the pressure to be measured, said first means comprising a yieldable stop member disposed in the path of movement of said free end, and second means to selectively increase and decrease the resistance offered by said member to movement of said free end, said first means comprising a leaf spring having a fixed end and a free end, the fixed end of said leaf spring being secured to the casing by a stop screw, said second means comprising a first stop member carried by said casing in engagement with one side of the free end of said leaf spring and a second stop member at the other side of said free end of said leaf spring engageable with the free end of said tube spring metering element.

4,108,008

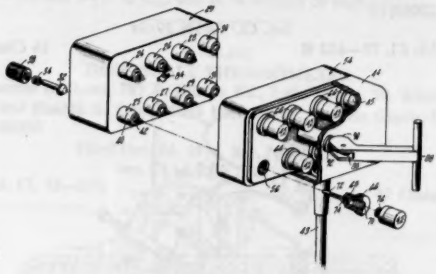
QUICK CONNECT MULTIPLE FLUID/ELECTRICAL TRANSDUCER APPARATUS

Terence W. Jowett, Avon, Conn., and Harvey A. Smith, Hampden, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 26, 1977, Ser. No. 845,510

Int. Cl.[2] G01L *7/00*

U.S. Cl. 73—756 **3 Claims**



1. A quick disconnect, multiple fluid/electrical transducer apparatus comprising:

a port block comprising a plurality of ports adapted to be connected to fluid lines in a vehicle or other structure having fluid lines, the parameters of which are desired to be sensed, each of said ports including a valve seat and a valve resiliently urged against the corresponding one of said valve seats, each of said valves selectively blocking the passage of fluid outwardly from the related one of the fluid lines through the related port;

a transducer block having a plurality of fluid-to-electrical transducers disposed therein said transducer block adapted for engagement with said port block, said transducer block having a fluid passage in fluid communication with each of said fluid-to-electrical transducers disposed for alignment and fluid communication with the corresponding ports of said port block when said two blocks are mutually engaged, said transducer block having a plurality of pushers, one for each of said ports, each operative to disengage a corresponding one of said resiliently seated valves away from the corresponding valve seat when said blocks are mutually engaged, thereby to open said fluid lines into fluid communication with said ports, and thereby with said passages and transducers, only when said blocks are mutually engaged;

a cable disposed to said transducer block independently of said port block including a plurality of electrical connections to respective ones of said fluid-to-electrical transducers; and

means for releasably securing said blocks in mutual, aligned engagement, whereby said transducers are electrically connected via said cable irrespective of mutual engagement of said blocks but fluid connection between said transducers and said lines is selectively made only through the releasable mutual, aligned engagement.

4,108,009

VARIABLE-FORCE VIBRATOR

Masao Fuchigami, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 29, 1976, Ser. No. 709,646

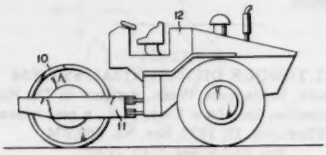
Claims priority, application Japan, Jul. 29, 1975, 50-104120[U]; Jul. 29, 1976, 51-104121[U]

Int. Cl.[2] F16H *33/00*

U.S. Cl. 74—61 **5 Claims**

1. In a vibrator, the combination of a rotatable hollow shaft, drive means for imparting rotation to said hollow shaft, a first eccentric weight fixedly mounted on said hollow shaft, a second eccentric weight rotatably mounted on said hollow shaft,

reciprocating means mounted within said hollow shaft for movement in its axial direction, a fluid actuated cylinder for linearly moving said reciprocating means relative to said hollow shaft, and means interconnecting said second eccentric weight with said reciprocating means for directly translating



the linear motion of said reciprocating means into controlled rotary motion of said second eccentric weight relative to said hollow shaft, whereby the angular position of said second eccentric weight on said hollow shaft can be adjustably varied with respect to said first eccentric weight for correspondingly changing the vibratory force developed by the vibrator.

4,108,010

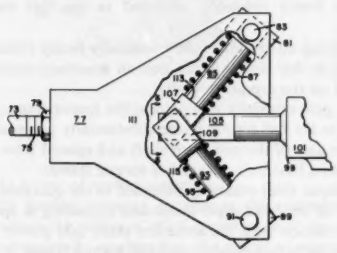
CONVEYOR-TYPE, HYDRAULIC-POWERED, MATERIAL-SPREADING APPARATUS

Bruce W. Taylor, Mechanicville, and Gregory J. Murray, Saratoga Springs, both of N.Y., assignors to Tarrant Manufacturing Company, Saratoga Springs, N.Y.

Division of Ser. No. 634,032, Nov. 21, 1975, Pat. No. 4,023,689. This application Feb. 18, 1977, Ser. No. 770,203

Int. Cl.[2] F16H *21/44*

U.S. Cl. 74—100 R **4 Claims**



1. A snap-action device for operative use with a member having a reciprocable element therein and a reciprocating rod to reciprocate and slam said reciprocable element in a direction of travel opposite to the direction of travel of said reciprocating rod, said snap-action device comprising a bifurcated mounting plate, two spring-mount guides, two spring mounts and two springs, said mounting plate mounting said spring-mount guides, said spring-mount guides freely receiving said spring mounts, said spring mounts carrying said springs, said mounting plate fixedly carrying said reciprocating rod, and said spring mounts and reciprocable element being joined in pivotal relationship.

4,108,011

SYNCHRONOUS DRIVE BELT AND PULLEY CONFIGURATION THEREFOR

Michael John William Gregg, Lisburn, and David Bell, Bangor, both of Northern Ireland, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

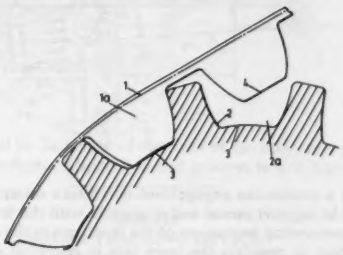
Filed Feb. 4, 1977, Ser. No. 765,575

Claims priority, application United Kingdom, Feb. 13, 1976, 05794/76

Int. Cl.[2] F16H *7/00*; F16G *1/28*

U.S. Cl. 74—229 **10 Claims**

1. In combination, (A) an endless synchronous drive belt formed of a resilient elastomer, reinforced with one or more reinforcing members extending along and thereby defining the pitch line, with a succession of identical teeth uniformly spaced apart by their pitch P, wherein each tooth has at least part of its fore and its aft flank surfaces shaped in cross-section as the arc of a circle of radius W, both said arcs being centered on the pitch line at centers spaced at a distance W apart; and (B) a pulley having a plurality of identical peripheral belt-engaging teeth defining between themselves pulley cavities, each pulley



cavity having at least part of its fore and its aft surfaces shaped in cross-section as the arc of a circle centered on the pitch circle, the pitch circle radius being the outer radius of the pulley at the pulley tooth periphery plus the distance between the base of the belt between the teeth, and the belt pitch line; wherein the tip of each tooth and the base of each cavity are relatively shaped so that when the belt engages with the pulley compressive stress is exerted from the base of the cavity through each engaging belt tooth.

4,108,012

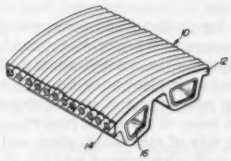
POWER TRANSMISSION BELT

John Craig Warner, Ithaca, N.Y., and Mark William Gravel, Keokuk, Iowa, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 10, 1976, Ser. No. 749,495

Int. Cl.[2] F16G *1/28, 5/00*

U.S. Cl. 74—231 C **5 Claims**



1. A power transmission belt comprising an elastomeric body, reinforcing tension means in said body, laterally positioned hollow stiffening members of multiple piece construction in said body and connected to said reinforcing tension means, said stiffening member being longitudinally spaced and extending substantially the width of said elastomeric body.

4,108,013

CONSTANT TENSION APPARATUS FOR FLEXIBLE ENDLESS DRIVE MEANS

Richard F. Sragal, 1701 Westbrook, Madison Heights, Mich. 48071

Filed Mar. 28, 1977, Ser. No. 782,007

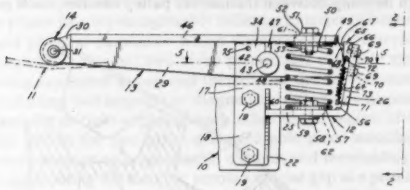
Int. Cl.[2] F16H *7/12, 7/10*

U.S. Cl. 74—242.11 C **10 Claims**

1. In a constant tension apparatus for flexible endless drive belts, the combination comprising:

(a) a support means;

(b) a lever arm pivotally mounted on said support means;
(c) a belt engagement member operatively mounted on said lever arm;
(d) biasing means carried on said support means and engageable with said lever arm for normally moving the lever arm in one direction to maintain the belt engagement member on the belt with a constant tension; and,



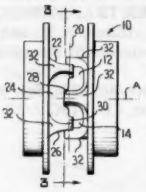
(e) a continuous engagement non-return means carried on the support means and engagable with the lever arm for preventing movement of the lever arm in the other direction to maintain the lever arm in operative engagement with the drive belt.

4,108,014

OBLIQUE LAY SPROCKET WHEEL AND CHAIN CONSTRUCTION

Kenneth D. Schreyer, Clarence, and Harold V. Hawkins, Williamsville, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,426
Int. Cl.[2] F16H *55/30*; F16G *13/02*
U.S. Cl. 74—243 H **4 Claims**



1. In an oblique lay pocket wheel for exerting tension on a chain trained thereover as the wheel is rotated, which comprises a body adapted to be rotated about a drive axis and having a transverse center plane normal to said axis, said body having a cylindrical portion extending on opposite sides of said center plane, a first series of chain link pockets in said cylindrical portion on one side of said center plane and circumferentially spaced from each other around said axis to present interrupted cylindrical portions therebetween, a second series of chain link pockets in said body on the other side of said center plane and circumferentially spaced from each other around said axis to present interrupted cylindrical portions therebetween, the pockets of said second series being circumferentially staggered with respect to the pockets of said first series whereby successive links of a chain may be received successively in the pockets of said first and second series thereof with the outer barrel of each link which is received in a pocket of said first series lying on a cylindrical portion separating adjacent pockets of said second series, and vice versa, whereby the plane of each such link lies at a fixed angle θ with respect to said center plane, the improvement wherein:

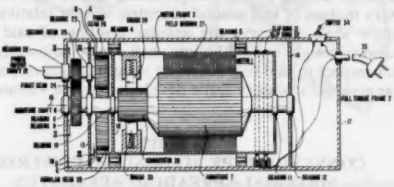
the end of each of said first series of pockets which trails, with respect to the direction of rotation of the wheel, extends radially outwardly to an associated cylindrical portion and projects at its radially outward portion past said center plane from said one side to said other side thereof and the end of each of said second series of pockets which trails, with respect to the direction of rotation of the wheel, extends radially outwardly to an associated cylindrical portion and projects at its radially outward portion past said center plane from said other side to said one side thereof whereby the load bearing point between each link and its pocket is substantially in line with said center plane.

4,108,015

FULL TORQUE DIFFERENTIAL SYSTEM

James N. Yanke, Bellingham, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jun. 23, 1977, Ser. No. 809,374
Int. Cl.[2] F16H *1/12, 1/20*
U.S. Cl. 74—421 A **2 Claims**



1. A full torque differential system for utilizing all forward and backward torques of an electric motor to produce a forward output torque, said full torque differential system comprising

a full torque frame of substantially cylindrical configuration;
a motor frame of substantially cylindrical configuration coaxially freely rotatably mounted in the full torque frame;
a motor having an armature shaft coaxially freely rotatably mounted in the motor frame and an armature coaxially mounted on the armature shaft;
an annular gear coaxially mounted in the motor frame;
a partition in the full torque frame substantially perpendicular to the axis of the armature shaft and spaced from and parallel to a base end of said full torque frame;
a power output shaft rotatably mounted in the partition and base end of the full torque frame and extending in spaced parallel relation with the armature shaft, said power output shaft extending outside said full torque frame;
a first gear coaxially affixed to and rotatable with the armature shaft;
a second gear coaxially affixed to and rotatable with the power output shaft and coupled to the first gear; and
a third gear coaxially affixed to and rotatable with the power output shaft in spaced relation with the second gear and coupled to the annular gear whereby mechanical power is applied from the annular gear to the output shaft via the third gear and power produced by the motor is applied from the first gear to the output shaft via the second gear so that all the motor torque is applied to the output shaft and essentially no torque is applied to the full torque frame.

4,108,016

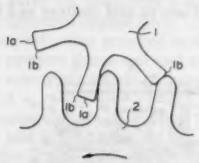
DEVICE OF PREVENTING REVERSE TRANSMISSION OF MOTION IN A GEAR TRAIN

Kenichi Muranishi, Ena, Japan, assignor to Ricoh Watch Co., Ltd., Nagoya, Japan

Filed Mar. 3, 1977, Ser. No. 773,846
Claims priority, application Japan, Mar. 3, 1976, 51-22993
Int. Cl.[2] F16H *55/06, 55/04*
U.S. Cl. 74—462 **7 Claims**

1. A device for preventing reverse transmission of motion in a gear train comprising a drive gear having teeth which are broadened towards the tip and a driven gear meshed together

with said drive gear whereby rotative motion is transmitted from said drive gear to said driven gear but not from said



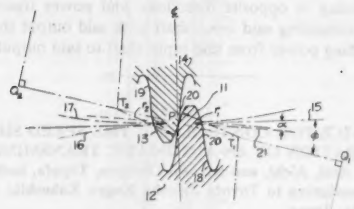
driven gear to said drive gear due to a blockage created by the teeth of said drive and driven gears.

4,108,017

STANDARD-PITCH GEARING

William Spence Rouverol, P.O. Box 9122, Berkeley, Calif. 94709

Filed Mar. 16, 1977, Ser. No. 778,260
Int. Cl.[2] F16H *55/06*
U.S. Cl. 74—462 **31 Claims**



1. In a pair of mating gears,
teeth having working profiles in the transverse plane for which the radius of relative curvature at the pitch point is substantially smaller than the radius of relative curvature at the pitch point for involute gears of the same size and pressure angle, but greater than one and one-tenth tooth modules,
the whole depth of the teeth of one of said pair being greater than two and six-tenths tooth modules,
the tooth pitch angle in the transverse plane for neither of said pair being greater than 10°.

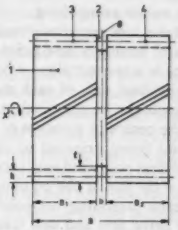
4,108,018

GEAR DRIVE WITH SINGLE-HELIX GEARS

Erich John, Augsburg; Albert Oesterle, Ottmarshausen, and Erich Pollak-Banda, Augsburg, all of Germany, assignors to Zahnräderfabrik Renk Aktiengesellschaft, Augsburg, Germany

Filed Feb. 16, 1977, Ser. No. 769,203
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607636
Int. Cl.[2] F16H *57/04;* **F01M** *11/00*
U.S. Cl. 74—467 **10 Claims**

1. A transmission comprising a pinion gear meshing with a further gear, each of said gears being formed with single-helix gear teeth and said gears meshing with each other in a meshing region, each of said gears being provided with at least one circumferential groove open in the direction of and registering with the groove of the other gear, said grooves having depths



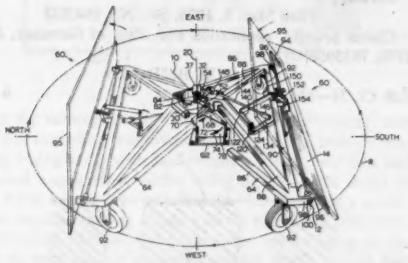
at least equal to the height of the teeth of the respective gear, and an oil deflector disposed in said grooves in said region.

4,108,019

SOLAR TRACKING DEVICE

Roger J. Martin, 1 Annesley Ave., Toronto, Ontario, Canada (M4G 2T5)

Filed May 19, 1977, Ser. No. 798,547
Int. Cl.[2] F16H *21/40, 21/52;* **F24J** *3/02*
U.S. Cl. 74—469 **4 Claims**



1. A solar tracking device comprising,
(a) a base member,
(b) a main driving shaft having a longitudinal first axis, said main drive shaft being mounted on said base for rotation about said first axis and being supported with said first axis extending parallel to the axis of rotation of the earth, said main drive shaft having a power output end,
(c) drive means connected to said main drive shaft for rotatably driving it about said longitudinal axis at one revolution per day,
(d) a carriage supported for azimuthal rotation, in a first plane which is angularly inclined with respect to said first axis, about a second axis which extends perpendicular to said first plane,
(e) a tracking head mounted on said carriage for altitudinal rotation about a third axis which is disposed in said first plane and spaced radially outwardly from said second axis and extends tangential to an arc generated from said second axis,
(f) azimuthal drive means comprising,
(i) a universal joint having a centre of gyration, a driving yoke, a driven yoke and a cross member, said cross member having driving arms connected to the driving yoke and driven arms connected to the driven yoke, the driving arms and driven arms having axes extending perpendicular to one another and intersecting said centre of gyration, the axis of the driven arms being oriented to extend perpendicular to said third axis, said driven yoke being connected to said main drive shaft and said driven yoke being connected to said carriage with its axis of rotation aligned with said second axis,

such that rotation of said main drive shaft drives said carriage about said second axis at an angular velocity which varies in accordance with the azimuthal velocity of the sun,

(g) altitude drive means comprising,

(i) an altitude drive arm projecting radially from said main drive shaft and having a first point thereon which describes an arc in a second plane which is perpendicular to said longitudinal axis of said main drive shaft and which intersects the longitudinal axis at a second point which is at the centre of gyration of said universal joint, said first point being oriented so that a line extending between said first point and said second point is parallel to the rays of the sun at the equinox,

(ii) linkage means extending between said first point on said altitude drive arm and said tracking head to maintain said tracking head at a fixed angle with respect to said line,

(iii) means for adjusting the angular position of said tracking head with respect to said linkage means to alter said fixed angle in accordance with the declination of the sun.

4,108,020

STEERING WHEEL COVER

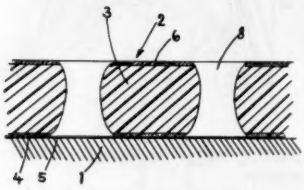
Reinhold Fleischmann, Fichtenstr. 7 8492 Furth i. Wald, and Erich Schach, Ilsenburger Str. 10, 3388 Bad Harzburg, both of Germany

Filed Mar. 8, 1976, Ser. No. 664,523

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1975, 7523050[U]

Int. Cl.[2] B62D *1/06*

U.S. Cl. 74—558 **6 Claims**



1. A steering wheel cover for enveloping the crown of an automobile steering wheel comprising:

a band of foam material having a pair of broad opposed surface skins, one of said skins defining an outer surface which is to be gripped by the hand in use and the other of said skins defining an inner surface for direct contact with the crown of the steering wheel; and

a plurality of perforations passing through said band from one surface skin to the other, the entire peripheral walls of said perforations being nonporous.

4,108,021

TRANSFER CASE

James Edwin MacAfee, Grosse Isle, Mich.; John W. Winkler, and Karl Budde, both of Toledo, Ohio, assignors to Jeep Corporation, Detroit, Mich.

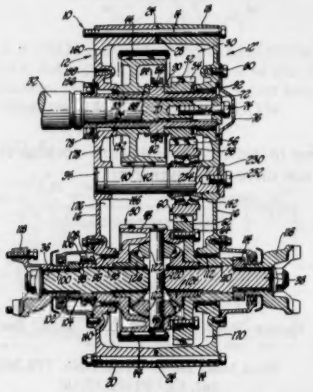
Continuation of Ser. No. 642,099, Dec. 18, 1975, abandoned.

This application Apr. 22, 1977, Ser. No. 790,109

Int. Cl.[2] F16H *57/02, 1/38, 1/40*

U.S. Cl. 74—606 R **21 Claims**

1. A transfer case comprising: a housing, said housing being made up of a pair of identical castings; each of said castings having an end wall, an endless skirt projecting from said end wall, and a mounting flange projecting outwardly from the end of said skirt remote from said end wall; said pair of castings being disposed in opposed relationship with a mounting flange of one of said castings secured to the mounting flange of the other of said castings, said castings cooperating to define a compartment within said housing; an input shaft rotatably mounted in the end wall of each of said castings; a pair of output shafts, one of said output shafts being rotatably supported in the end wall of one of said castings and the other of



said output shafts being rotatably supported in the end wall of the other of said castings, said output shafts projecting from said housing in opposite directions; and power transmitting means connecting said input shaft with said output shafts for transmitting power from said input shaft to said output shafts.

4,108,022

DEVICE FOR CONTROLLING THE SPEED SHIFT OPERATION OF AN AUTOMATIC TRANSMISSION

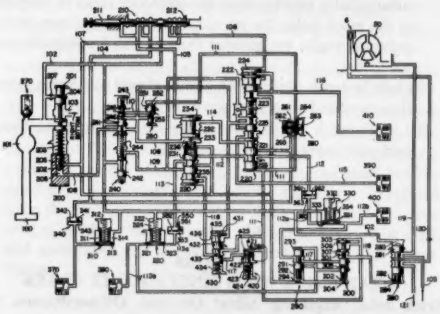
Hajime Arai, Aichi, and Kiyoshi Ohnuma, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 27, 1976, Ser. No. 736,098

Claims priority, application Japan, Mar. 9, 1976, 51-25379

Int. Cl.[2] F16H *47/00*

U.S. Cl. 74—645 **6 Claims**



1. In an automatic fluid transmission comprising an input shaft, an output shaft, a planetary gear mechanism provided between said input and output shafts, and friction engaging means adapted to be selectively engaged or disengaged so as to establish a plurality of forward speed ranges and a reverse range, a device for controlling the speed shift operation of said transmission comprising:

an oil pressure source;

a pressure regulating valve for regulating the oil pressure supplied from said oil pressure source to generate a line pressure;

servo chambers adapted to receive said line pressure and to actuate friction engaging means;

a governor valve for generating a first oil pressure signal which represents vehicle speed;

a throttle valve for generating a second oil pressure signal which represents engine load;

at least one shift valve actuated by the balance between said first oil pressure signal and said second oil pressure signal so as to selectively supply oil pressure to said servo chambers; and

a valve composite including a first change-over valve actuated by said first oil pressure signal and a second change-over valve actuated by said second oil pressure signal and adapted to intercept the supply of said first oil pressure signal to said shift valve only when said first oil pressure signal is below a first predetermined value and said second oil pressure signal is above a second predetermined value.

4,108,023

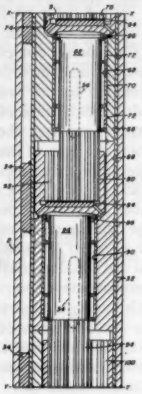
GEAR SYSTEM

Marion A. Garrison, Denver, Colo., assignor to Empire Oil Tool Company, Denver, Colo.

Continuation of Ser. No. 568,496, Apr. 16, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,108

Int. Cl.[2] F16H *1/28;* E21B *5/00*

U.S. Cl. 74—804 **2 Claims**



1. A reduction gear system comprising a pair of sets of meshing pinions and internal gears, said pair of sets including a first set and a second set, each of said sets including a single pinion in direct mesh with a single internal gear having a substantially larger diameter than said single pinion, the axis of said single pinion being parallel to the axis of said single internal gear but spaced therefrom, a first shaft connecting the internal gear of the first set to the pinion of the second set, a second shaft supporting the pinion of the first set, a third shaft supporting the internal gear of the second set, the axes of said second and third shafts being in alignment and parallel to but spaced from the axis of the first shaft, and means for rotatably supporting said shafts.

4,108,024

INDEXING DEVICES

Heinz Ditzel, and Werner Ditzel, both of Hainstrasse 27-29, 6369 Schoneck 1, Germany

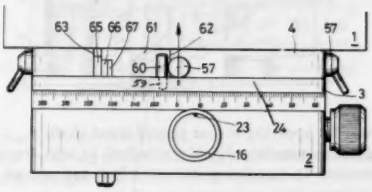
Filed Nov. 4, 1975, Ser. No. 628,649

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1974, 2452340; May 6, 1975, 2520022

Int. Cl.[2] B23B *29/24;* B23Q *17/00*

U.S. Cl. 74—813 L **1 Claim**

1. An indexing device comprising first, second and third discs substantially coaxial with one another, said first, second and third discs being rotatably mounted relative to each other; first and second engagement means formed of said first and second discs are releasably engageable to latch said first and second discs in any selected relative angular position; said second and third discs having respective abutment surfaces; gage means positioned between said abutment surfaces for angularly positioning said second and third discs relative to each other by turning each of said discs until said gage means abuts both of said abutment surfaces; clamping means including a clamping member movable in an axial direction of said discs for clamping said second and third discs against relative turning; said second disc having therein a first radially extending passage and said third disc having therein a second passage extending transversely to said first passage and communicating with the latter; said clamping means including a first pin with an eccentric portion, being positionable in said first passage; a second pin received in said second passage; and retaining means formed of said third disc arranged to engage said second pin for limiting movement of the latter lengthwise of said second passage, said eccentric portion engaging said second



pin whereby turning of said first pin enables movement, said second pin extending lengthwise of said second passage into clamping engagement with said retaining means; said first and said second engagement means being defined by a series of parallel bores arranged in said first disc positioned at a predetermined angular spacing along a circle extending concentrically therewith, said second engagement means being in the form of an indexing pin arranged parallel in the second disc which indexing pin slides into any selected bore; said bores and indexing pin forming coarse preadjusting means to permit coarse adjustment of said first disc relative to said second disc and relative to said third disc clamped to said second disc; said second disc having an abutment surface in the form of a pin projecting from said disc, said pin coacting with said gage means associated wth said second and third discs, and said gage means being disposed at an angular spacing different than the predetermined angular spacing of said bores to thereby define fine adjusting means for adjusting said first disc clamped to said second disc, relative to said third disc engaged with said second disc after coarse adjustment of said first disc relative to said second disc.

4,108,025

AIRCRAFT HEAD-UP DISPLAY UNIT MOUNT ADJUSTMENT TOOL

Clifton E. Stine, Ridgecrest; Woodrow D. Chartier, Jr., and Mike A. Caponegro, both of China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,277

Int. Cl.[2] B25B *9/04*

U.S. Cl. 81—3 R **11 Claims**

1. An alignment tool for adjusting the position of a first body relative to a second body, comprising:

a frame having

attachment means for fastening said frame to said first body,

a top block,

a bottom block,

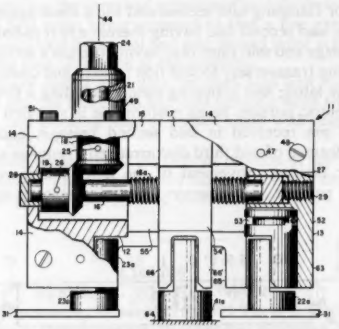
first and second side plates joining said top and bottom blocks,

a driven shaft having a threaded central portion, said shaft being rotatably retained by said top and bottom blocks,

an input shaft rotatably retained in said bottom block,

an input gear rigidly retained to said input shaft,

a driven gear rigidly retained to said driven shaft and maintained in driven engagement with said input gear, and



means for applying torque to said input shaft;

an adjusting member slidably attached to said frame and restrained to translation between first and second positions;

means on said adjusting member cooperating with said driven shaft for causing translation of said adjusting member between said first and second positions; and

said adjusting member having means for applying driving force against said second body.

4,108,026

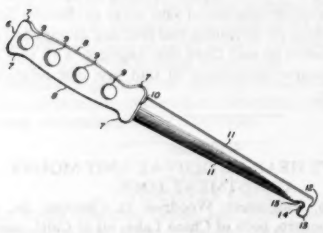
TOOL FOR REMOVING ROCK CLIMBING CAPTIVE DEVICES

Gordon K. Anderson, 14632 Pacific St.; Steven M. Leuck, 14801 Briarcliff Pl., both of Tustin, Calif. 92680, and Gary L. Ruhl, 104 Crescent Dr., Ft. Scott, Kans. 66701

Filed May 31, 1977, Ser. No. 801,852

Int. Cl.[2] B25B *9/00*

U.S. Cl. 81—3 R **3 Claims**



1. A tool for removing rock climbing captive devices comprising a substantially flat, rigid handle; a plurality of aligned holes spaced longitudinally along said handle; opposing lateral appertenances on the front and rear ends of the handle; a blade extending longitudinally from and integral with said front end of said handle; said blade being tapered away from said handle and including an offset hook on its end opposite the end integral with said handle; opposed recesses, one being at the junction of said blade and offset hook substantially facing said handle and the other being on the exterior of said hook facing in the longitudinal direction.

4,108,027

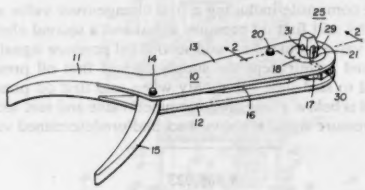
RATCHET WRENCH WITH DOUBLE SWIVELLING DRIVE SHAFT

Paul E. Lenker, Davenport, Iowa, assignor to Davenport Tool Co., Eldridge, Iowa

Filed Apr. 14, 1977, Ser. No. 787,526

Int. Cl.[2] B25B *13/46*

U.S. Cl. 81—60 **5 Claims**



1. In a ratchet wrench including a ratchet member and a socket drive member mounted for rotation about a common axis relative to the remainder of the wrench, the ratchet member having a drive aperture therein about said axis, the drive member and ratchet member drive aperture having corresponding side walls disposed about said axis, the drive member having a pair of axially spaced drive portions each of which includes portions of the drive member side walls between two axially spaced locations therealong, one of the drive portions being disposed in the ratchet member drive aperture with its side walls in opposed relation to the ratchet member drive aperture side walls for driving rotation of the drive member about said axis by the ratchet member, the other of the drive portions projecting beyond one face of the wrench to removably slidably receive thereon the drive aperture of a socket for driving rotation of the socket by the drive member, and means retaining the drive member in the drive member aperture, the improvement wherein the drive member can swivel relative to the ratchet member and a socket disposed on the projecting drive portion as aforesaid can simultaneously swivel relative to the drive member, said improvement comprising the side walls of each drive portion each having a generally convex configuration such that the cross-sectional areas of each drive portion at said locations therealong are less than cross-sectional areas of the drive portion between said locations.

4,108,028

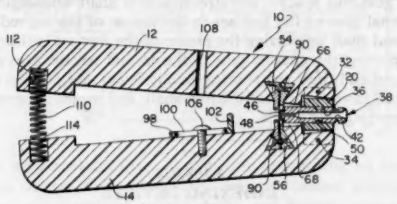
WIRE STRIPPER HAVING REPLACEABLE BLADES

Joseph A. Perrino, Rehoboth, Mass., assignor to Micro Electronics, Inc., Newport, R.I.

Filed Feb. 22, 1977, Ser. No. 770,984

Int. Cl.[2] H02G *1/12*

U.S. Cl. 81—9.5 B **3 Claims**



1. A device for stripping insulation from relatively small diameter electrical wire, comprising a pair of hand-held elongated grip members, means for pivotally interconnecting said grip members at one end thereof, the other ends of said grip members being movable relative to each other to provide for the pivotal movement of said members to and from a closed

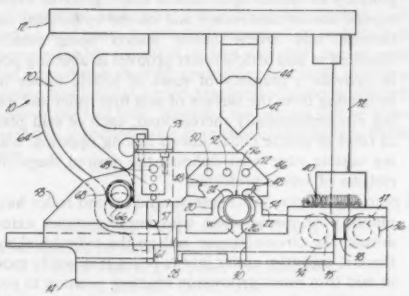
stripping position thereof, an elongated tubular guide located in said interconnecting means intermediate the said grip members and receiving therein in guiding relation the lead-in portion of a wire from which insulation is to be stripped, a reduced projection formed on the innermost end of said tubular guide, each of said grip members having a laterally extending slot formed therein, opposed blade assemblies removably secured in the slots in said grip members for movement with said grip members to the closed position thereof, each of said blade assemblies including an inner and outer holder element having flat opposed faces, a flat blade element located between the flat opposed faces of the holder elements in sandwiched relation and having a cutting edge in which a notch is formed, wherein the opposed blades in the closed stripping position define an opening of predetermined size for receiving the wire from which insulation is to be stripped, each of said holder elements having a circular notch formed therein that is aligned with the notch in the adjacent blade element, the diameter of the notch in said outer holder element being greater than the diameter of the notch in said inner holder element, the notches in the outer holder element of both blade assemblies forming an opening when the grip members are moved to the closed stripping position, the size of which is just slightly larger than that of said reduced projection, so that the reduced projection is received in snug-fitting relation between the notches of the outer holder elements, thereby axially aligning said tubular guide and wire extending therethrough and centering said wire for engagement by said blade elements during the severing of the wire insulation during said stripping operation, whereafter a longitudinal retracting movement of said wire will strip the insulation from the lead-in portion thereof that has been threaded through said tubular guide.

4,108,029

CUT-OFF DIE SET

Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.

Filed May 23, 1977, Ser. No. 799,205
Int. Cl.[2] B26D *1/56, 3/16*
U.S. Cl. 83—54 **16 Claims**



1. A cut-off die set for use in an elongated stock cut-off apparatus of the type including a ram mechanism for operating said cut-off die set, said die set comprising:

clamping means adapted to be operated by said ram mechanism clamping said die set to said stock;

a main cut-off blade, and means operated by said ram mechanism causing said main cut-off blade to move to sever said stock after said clamping means clamps said die set to said stock;

notching means for notching said stock periphery prior to said severing by said main cut-off blade at the point on said stock at which said severing is initiated, said notching means including: a notching blade, means producing notching of said stock by drawing said notching blade across said stock prior to said severing of said stock by said main cut-off blade;

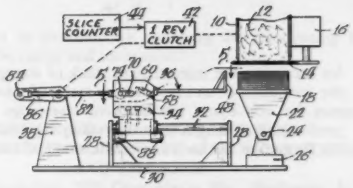
means repositioning said notching blade in said initial position after said main cut-off blade has severed said stock at said notching point, whereby said notching and return strokes of said notching blade occur before and after respectively of said severing movement of said main cut-off blade.

4,108,030

SLICE EJECTOR FOR SLICING MACHINES

George G. Griswold, Fort Wayne, Ind., assignor to Peter Eckrich and Sons, Inc., Fort Wayne, Ind.

Filed Sep. 7, 1977, Ser. No. 831,299
Int. Cl.[2] B26D *4/46, 4/56*
U.S. Cl. 83—77 **7 Claims**



1. a stack ejector comprising:

a stack receiving platform having a pair of stack supporting surfaces separated by an elongated space;

a carriage mounted for reciprocation movement towards and away from said platform generally in the direction of said space;

means for reciprocating said carriage;

a stack engaging assembly movably mounted on said carriage and movable therewith through said space and further movable on the carriage between a first position intersecting a plane encompassing said surfaces and a second position not intersecting said plane; and

means on said carriage for (a) moving said stack engaging assembly from said first position to said second position at one extreme position of movement of said carriage, (b) maintaining said stack engaging assembly in said second position until the other extreme position of movement is reached, (c) moving said stack engaging assembly to said first position when said other extreme position is reached, and (d) maintaining said stack engaging assembly in said first position until said one extreme position is reached.

4,108,031

ALIGNING AND STACKING ARRANGEMENT

Karl Dangelmaier, Göppingen-Holzheim, and Alfred Kottmann, Donzdorf, both of Germany, assignors to L. Schuler GmbH, Germany

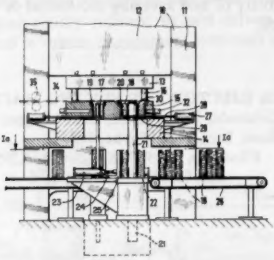
Filed Feb. 14, 1977, Ser. No. 768,343
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2605983
Int. Cl.[2] B30B *15/32*
U.S. Cl. 83—90 **32 Claims**

1. An alignment and stacking arrangement for stampings manufactured in a continuous stamping operation by a stamping machine having a punch and an associated punch matrix, the alignment and stacking arrangement comprising:

at least one stacking channel means arranged at the punch matrix for receiving stampings produced by the stamping machine during a continuous stamping operation,

means associated with said at least one stacking channel means for forming an intermediate stack of stampings upon a produced stack of stampings reaching a predetermined height including at least one selectively engageable locking pawl means for reducing a clearance of the at least

one stacking channel means, said locking pawl means extending into the clearance of the at least one stacking channel means only during the formation of an intermediate stack of stampings, and at least one mandrel means arranged within said at least one stacking channel means



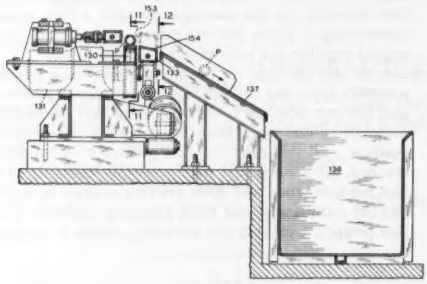
for receiving the intermediate stack of stampings during the formation of an intermediate stack of stampings, and means for conveying the stack of stampings having the predetermined height from the stamping machine during the formation of the intermediate stack of stampings.

4,108,032

MULTIPLE BLADE SCRAP SAW FOR PIPE MILL

William R. Scheib, Sewickley, Pa., and Ralph M. Shaffer, Jr., Huffman, Tex., assignors to Aetna-Standard Engineering Co., Ellwood City, Pa.

Division of Ser. No. 661,371, Feb. 25, 1976, Pat. No. 4,022,092. This application Dec. 6, 1976, Ser. No. 747,941
Int. Cl.[2] B26D *7/06*
U.S. Cl. 83—106 **1 Claim**



1. A scrap kick-out conveyor for a continuous buttweld pipe mill installation provided with a scrap cut-off saw between the forming and welding mill and subsequent processing mills, which comprises

(a) stock advancing conveyor rolls located on the pass line downstream of the scrap saw,

(b) inboard and outboard lateral guide rails on opposite sides of the pass line for guiding and confining pipe stock supported on said conveyor rolls,

(c) means for retracting at least selected portions of the outboard guide rail,

(d) means for diverting at least selected portions of the inboard guide rail to lie at an angle across the pass line to divert oncoming cut scrap pipe sections off of the outboard side of the conveyor,

(e) means for receiving diverted scrap pipe sections for disposal, and

(f) an inclined apron provided adjacent the outboard guide rail,

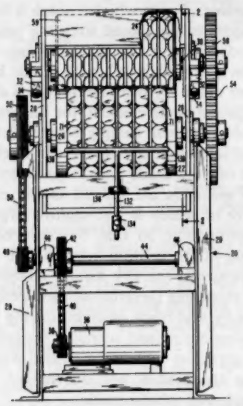
(g) said selected portions of the outboard rail being downwardly retractable and having a downwardly inclined upper surface to facilitate gravity discharge of scrap pipe diverted from the pass line.

4,108,033

ROTARY CUTTING DEVICE FOR FORMING STRIPS OF SHAPED ARTICLE PREFORMS

William E. Bembenek, Dallas, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed May 4, 1976, Ser. No. 682,904
Int. Cl.[2] B23D *25/12*
U.S. Cl. 83—122 **6 Claims**



1. Apparatus for cutting a plurality of ribbons of article preforms having a desired shape and a plurality of ribbons of trim from a thin, wide ribbon of material, comprising

a first roller and a second roller rotatably mounted juxtaposed to each other with their axes parallel, said first and second rollers defining a bite between their cylindrical surfaces;

a plurality of article cutter inserts, said first roller having a plurality of spaced-apart article insert grooves extending around the circumference and on the cylindrical surface thereof, said article cutter inserts being removably mounted in said article insert grooves in abutting position to provide a plurality of rows of article cutter inserts projecting from the surface of said first roller and extending circumferentially therearound, each of said plurality of rows of article cutter inserts having opposed, undulating cutting edge sides defining the desired shape of said ribbons of article preforms;

a plurality of trim cutter inserts, said second roller having a plurality of spaced-apart trim insert grooves extending around the circumference and on the cylindrical surface thereof, said trim cutter inserts being removably mounted in said trim insert grooves in abutting position to provide a plurality of rows of said trim cutter inserts projecting from the surface of said second roller and extending circumferentially therearound, each of said plurality of rows of trim cutter inserts having opposed undulating sides forming cutting edges which are spaced apart and extend circumferentially around said second roller, and are shaped to closely, interfittingly receive said cutting edges of said article cutter inserts at the bite of said first and second rollers, and

said article insert grooves and said trim insert grooves being arranged on said first and second rollers so that said circumferential rows of article cutter inserts and said circumferential rows of trim cutter inserts cooperate with each other at said bite to be brought into shearing engagement at said bite upon rotation of said first and second rollers for cutting a ribbon of material introduced into said bite

into transversely alternating ribbons of article preforms and ribbons of trim;

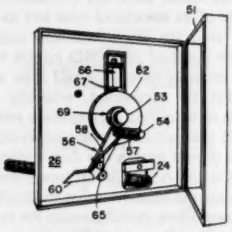
means for rotating said first and said second rollers to pass said article cutter inserts forming each of said plurality of circumferential rows of article cutter inserts, and said trim cutter inserts forming each of said plurality of circumferential rows of trim cutter inserts through said bite so that mating ones of said article cutting edges and said trim cutting edges are brought into shearing engagement to thereby cut a ribbon of material fed to said bite into said ribbons of articles and said ribbons of trim.

4,108,034

SNAP CUTTER APPARATUS FOR PAPER TUBES

Anthony Vincent Thomas, Prospect Heights, Ill., assignor to Precision Paper Tube Company, Wheeling, Ill.

Filed Jun. 13, 1977, Ser. No. 806,106
Int. Cl.[2] B26D 3/16
U.S. Cl. 83—361 **5 Claims**



1. In apparatus for cutting paper tubes of small diameter including means for moving formed tubes through a cutting station, the improvement comprising: free-hanging sensor means adapted to be moved by the distal free end of a tube after passing through said cutting station; means responsive to the movement of said sensor means for generating a signal; cutter means including a knife adapted to swing through an orbit to sever said tube at said cutter station; and timer means responsive to said signal for actuating said cutter means for one cycle of operation, said cutter means comprising a shaft, a disc mounted on said shaft, a stub shaft mounted on said disc, said knife being rotatably mounted on said stub shaft, spring means mounted on said stub shaft for preloading said knife, and means for stopping said knife at a predetermined position in said orbit, prior to severing said tube, whereby said spring will be wound when said disc is rotated prior to release of said knife in cutting said tube.

4,108,035

MUSICAL NOTE OSCILLATOR

Sydney A. Alonso, Strafford, Vt. 05072

Filed Jun. 6, 1977, Ser. No. 803,535
Int. Cl.[2] G01F 1/00
U.S. Cl. 84—1.01 **24 Claims**

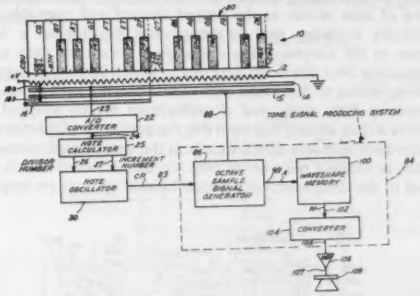
1. A digital electronic musical instrument capable of producing notes in narrow, controllable frequency intervals comprising:

means for selecting a desired note having a fundamental frequency;

digital oscillator means for cyclically performing incrementing operations over a variable range at a variable increment, for generating a carry pulse and a remainder when the range is exceeded, and for readjusting the range in proportion to the remainder in response to each carry pulse;

digital calculator means responsive to said means for selecting which automatically calculates the values of the range and increment so that the repetition rate of the carry pulses is a multiple of the fundamental frequency; and

means for producing the desired note in response to at least some of the carry pulses, whereby the pitch of the desired



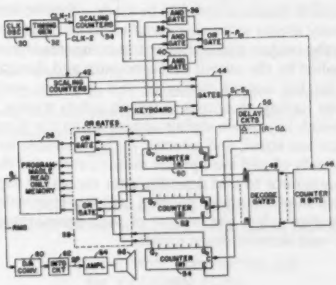
note can be modified by changing the relationship between the range and increment.

4,108,036

METHOD OF AND APPARATUS FOR ELECTRONICALLY GENERATING MUSICAL TONES AND THE LIKE

Frank H. Slaymaker, 134 Glen Haven Rd., Rochester, N.Y. 14609

Filed Jul. 31, 1975, Ser. No. 600,687
Int. Cl.[2] G10H 1/00
U.S. Cl. 84—1.01 **20 Claims**



12. Apparatus for generating musical and the like tones which comprises

means for storing successive samples which define the impulse response which characterize the special characteristics of said tones,

means for providing repetitive signals having selected repetition rates, and

means responsive to said repetitive signals and operative upon said samples in said storing means for convolving said impulse response therewith for generating said tones with different pitches corresponding to the repetition rate of said repetitive signals.

4,108,037

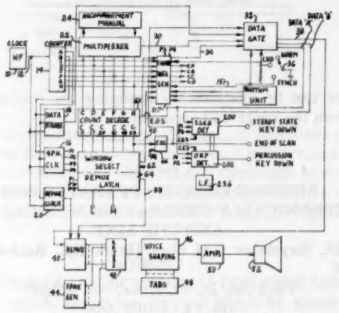
ELECTRONIC ORGAN HAVING DIFFERENT SELECTABLE MODES OF PLAYING THE ACCOMPANIMENT KEYBOARD

John William Robinson, and Brian Norris Wilcox, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Aug. 2, 1976, Ser. No. 710,791
Int. Cl.[2] G10H 1/00
U.S. Cl. 84—1.03 **20 Claims**

1. In an electronic organ having tone generator means,

transducer means, keyers controlling the supply of tone signals from the generator means to the transducer means, keyboard means comprising playing keys, multiplexer means having an output and including a clock driven counter producing a pluaality of data words at the output thereof and operable for cyclically scanning said keyboard and developing a data stream at the output of the multiplexer means on each scan comprising time displaced data bits in which key down signals corresponding to depressed ones of said playing keys appear in respective time slots, and demultiplexer means adapted to receive a data stream and operable for actuating said keyers in conformity with key down signals in the data stream, memory means in which a plurality of data words are stored which are equal to the data words developed by said counter on respec-



tive counts, said memory means having output means, playing key controlled means adapted to be made effective for causing said memory means to supply a single one of its data words at a time to the output means thereof, a comparator having one input supplied by the output of the counter and the other input supplied by the output means of said memory means, said comparator having an output at which a data stream is developed in which key down signals appear when the inputs to the comparator are equal, and selector means operable to connect either one only of said multiplexer means output and the output of said comparator to said demultiplexer means for supplying a data stream thereto and for causing said key controlled means to be effective when the output of said comparator is connected to said demultiplexer means.

4,108,038

TIME SHARED TONE KEYING SYSTEM IN ELECTRONIC MUSICAL INSTRUMENT

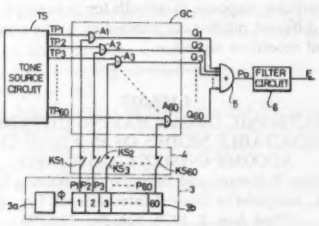
Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 30, 1976, Ser. No. 671,861

Claims priority, application Japan, Apr. 4, 1975, 50-41022; Apr. 8, 1975, 50-42670; Apr. 9, 1975, 50-43806

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.03 **8 Claims**



1. An electronic musical instrument comprising:

a tone source signal generator for simultaneously generating a plurality of square wave tone signals, each of an audible frequency corresponding to a respective note of a scale having several octaves and each on a separate output of said tone source signal generator;

a sequence pulse generator having a plurality of separate outputs, each corresponding to a respective separate output of said tone source signal generator, said sequence pulse generator being operative in repetitive cycles to sequentially produce in each cycle a respective sequence pulse at each separate output thereof in the order of sequence of the notes of said scale, the sequence pulses produced at each said separate output having an ultra-audible repetition frequency;

a plurality of AND circuits equal in number to the number of separate outputs of said tone source signal generator, each AND circuit being directly connected at its input to a respective one of said tone source signal generator outputs;

a key switch circuit including respective key switches for each note of said scale, each key switch being operable upon depression of its associated note key to connect the corresponding separate output of said sequence pulse generator to the input of the AND circuit to which the corresponding separate output of said tone source signal generator is directly connected, whereby each AND circuit will pass to its output all sequence pulses received at its input from said sequence pulse generator by way of said key switch circuit during the duty cycles of the tone signal received at the AND circuit input; and

an OR circuit connected in common at its input to all of the outputs of the respective AND circuits for combining the sequence pulses at all said AND circuit outputs and thereby obtaining at the OR circuit output a train of tone signal pulses corresponding to the depressed keys.

4,108,039

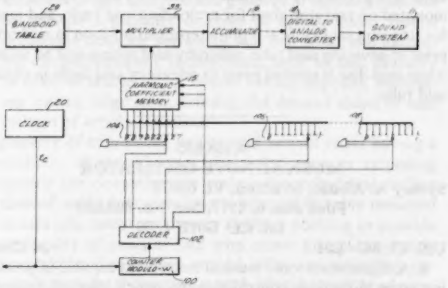
SWITCH SELECTABLE HARMONIC STRENGTH CONTROL FOR A TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Aug. 9, 1976, Ser. No. 712,737

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.19 **6 Claims**



1. In a computer organ or the like in which individual tones are generated by calculating data corresponding to the amplitudes of a plurality of points of the waveform of a selected tone, the date being calculated by summing for each point the product of a stored coefficient value and a sinusoid value for each of a predetermined number of harmonics, apparatus for preselecting the tonal quality by selectively modifying the calculated data comprising: an addressable memory for storing at least one set of coefficient values, means for generating addresses in a predetermined sequence, and means coupling the address generating means to the memory for addressing and reading out a selected one of the coefficient values from the memory at a time, said means including switch means for

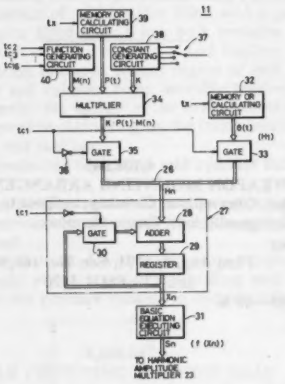
preselectively changing the sequence in which the memory is addressed in response to the addressing means to change the sequence in which each of the coefficient values is read out of memory, whereby the coefficient values used in the calculation of the data may be selectively varied.

4,108,040

ELECTRONIC MUSICAL INSTRUMENT

Masanobu Chibana; Tsuyoshi Futamase, and Hideo Yamada, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 17, 1976, Ser. No. 742,586
Claims priority, application Japan, Nov. 19, 1975, 50-139005
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.19 **6 Claims**



1. In an electronic musical instrument of the type having calculating circuitry for individually calculating the amplitude of each harmonic component, said circuitry providing a signal indicative of the order of the harmonic component currently being calculated, an accumulator for accumulating the amplitudes of all harmonic components to establish a sample point amplitude for the tone being generated, and a converter for converting the established sample point amplitudes to musical tones, the improvement for imparting a multipeak filter characteristic to said musical tones, comprising:

a first circuit, operative when said signal indicates that the harmonic component of lowest order is being calculated, for providing a value H_1 establishing the initial point of said multipeak filter characteristic,

a second circuit, for establishing separate values H_n for values of *n* greater than 1, where *n* is the harmonic component order,

an accumulation circuit for accumulating the sum of H_1 plus all of the separate values H_n for each harmonic component or order lower than that of the harmonic component currently being evaluated to obtain an accumulated value

$$Xn = H_1 + \sum_{n=2}^{i-1} H_n$$

where *i* is the current harmonic component order,

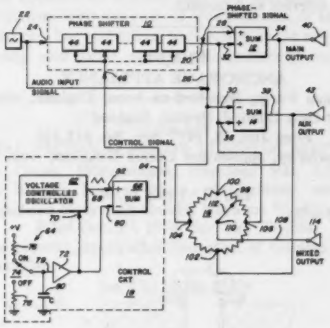
multipeak filter means connected to receive the output of said accumulation circuit, for providing a multipeak filter relative amplitude value in accordance with the accumulated value X_n received from said accumulation circuit.

4,108,041

PHASE SHIFTING SOUND EFFECTS CIRCUIT

Robert A. Moog, East Aurora, N.Y., and Roger Flavius Cox, Northbrook, Ill., assignors to Norlin Music, Inc., Lincolnwood, Ill.

Filed Jun. 25, 1976, Ser. No. 700,250
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **30 Claims**



1. In a special sound effects circuit having a phase shifter for developing a signal shifted in phase with respect to an input signal, said phase shifter having a characteristic frequency at which phase shifting commences, means for combining the phase shifted and input signals, and means for periodically modulating the characteristic frequency, a modulation control circuit, comprising:

means for generating a control signal;

means responsive to the control signal for altering the rate of periodic modulation; and

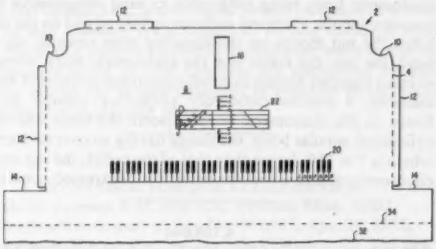
means responsive to the control signal for unidirectionally varying the characteristic frequency as the rate of periodic modulation is changed.

4,108,042

MUSIC TEACHING MACHINE

Harry Blau, 1431 Ocean Ave., Apt. 1412, Santa Monica, Calif. 90401

Filed Jun. 6, 1977, Ser. No. 803,441
Int. Cl.[2] G09B *15/02*
U.S. Cl. 84—471 R **8 Claims**



6. A music teaching machine comprising a rotatable disc having predetermined information thereon sandwiched between a first and second panel having a cut out provided therein for selectively displaying said information on said discs, said improvement comprising:

a piano keyboard printed on said first panel;

a pointer slidable coupled to said first panel for pointing out keys in response to information displayed in said cut out in said first panel;

at least one finger rest provided in said first and second panel; and

a strip extension provided along an edge of said first and second panels adjacent said pointer and extending from said first and second panels whereby said strip extension is pressed into a chest of an operator by a finger of said operator engaged with said finger rest and said music teaching machine is comfortably supported such that said operator can easily read the information displayed and can easily operate said pointer.

4,108,043

ANCHORAGE APPLIANCE

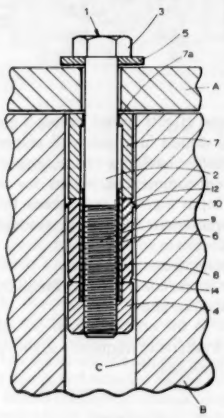
Otto Herman Varga, Bradford-on-Avon, England, assignor to Resilient Grip Limited, Bristol, England

Filed Jun. 28, 1977, Ser. No. 811,126

Claims priority, application United Kingdom, Aug. 2, 1976, 32043/76

Int. Cl.² F16B *13/06*

U.S. Cl. 85—70 **6 Claims**



1. An anchorage appliance comprising a bolt having a head and a threaded stem, a nut on said stem, a metal sleeve permanently associated with the nut and encircling the stem, a cylindrical annular body of elastomeric material, for example rubber, mounted on the sleeve and having one end thereof abutting the nut, a metal collar telescoping over the sleeve, the elastomeric body being subjectible to axial compressive force between annular abutment surfaces on the nut and on the collar when the nut moves up the threaded stem towards the bolt head, the nut, the collar and the elastomeric body when unstressed together having external cylindrical surfaces of similar diameter, a narrow outwardly projecting annular flexible flange on the elastomeric body adjacent the other end of the cylindrical annular body, the flange having an overall diameter which is 7 to 15% larger than that of the collar, the nut and the elastomeric sleeve when the latter is in unstressed condition.

4,108,044

DEVICE FOR GREASING MUZZLE-LOADING BULLETS

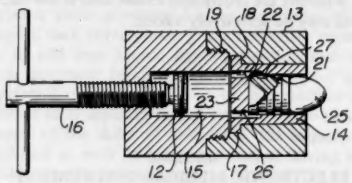
Richard Brown, 468 Metzgar St., Half Moon Bay, Calif. 94019

Filed Mar. 21, 1977, Ser. No. 779,330

Int. Cl.² F42B *31/02*

U.S. Cl. 86—19 **6 Claims**

1. A portable, pocket size device for greasing muzzle-loading type bullets comprising a stock having a grease-containing chamber, hand-operable piston means for forcing grease through the chamber, a removable die attachable to an open end of the stock chamber in axial alignment therewith, the cylindrical adapter removably held by the die against the open end of the stock chamber, the adapter having a base portion to limit the depth of insertion of a bullet into the adapter and an inner portion defining a passage around the base portion such



that grease in the chamber can be forced by the piston through the passage and into the grooves of the bullet.

4,108,045

WEAPON MOUNTING ARRANGEMENT

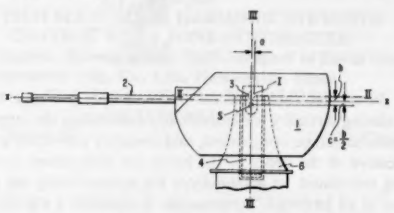
Rolf Herbst, Obervellmar, Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Germany

Germany

Filed Aug. 2, 1971, Ser. No. 168,362

Int. Cl.² F41H *5/20*

U.S. Cl. 89—36 K **3 Claims**

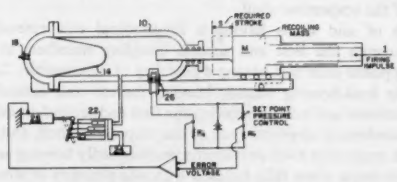


1. In a cardanically suspended movable turret having a tubular weapon mounted therein so that the bore axis of the barrel of said weapon intersects the vertical rotational axis of said movable turret and a center of gravity which is always vertically displaced from and below said bore axis of the barrel of said weapon and the elevation axis of the cardanic suspension of said turret, but which moves between a first position when the turret is fully loaded with ammunition and a second position when the turret contains no ammunition, the improvement wherein said weapon is mounted in said turret so that said bore axis of the barrel of said weapon lies in between said elevation axis of the cardanic suspension of said turret and said center of gravity of said turret, and when said turret and said weapon are aligned so as to cause said center of gravity to be vertically displaced from said elevation axis of the turret suspension along said vertical rotational axis, the vertical distance along said vertical rotational axis between said bore axis and said elevation axis is approximately equal to the vertical distance along said vertical rotational axis between said bore axis and the average position of said center of gravity of said turret whereby the effective path of the recoil force of said weapon, which path is along the bore axis of said weapon, is moved toward the center of gravity of said turret and consequently the torque exerted on the turret during the firing is reduced.

4,108,046
LIQUID-GAS CONSTANT FORCE RECOIL SPRING

Louis J. Kiraly, Brook Park, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 6, 1975, Ser. No. 584,666
Int. Cl.[2] F16F *5/00, 9/08*
U.S. Cl. 89—43 A **3 Claims**

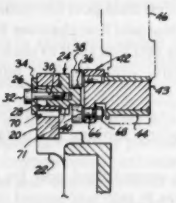


1. A constant-force liquid-gas spring comprising:
a cylinder defining a first region comprising a gastight bladder, the interior of said bladder filled with a gas, and a second region filled with a low bulk modulus liquid in direct contact with the exterior of said bladder; and
a piston entering into said second region of said cylinder, said piston and cylinder being movable relative to each other, whereby the energy of the inward motion of said piston is stored in said spring by the compression of both said liquid and said gas;
means for introducing liquid into said cylinder including:
a pump: and
a reservoir for storing said liquid, said pump being coupled to said reservoir for pumping liquid to and from said cylinder; and
a pressure sensor located within said second region of said cylinder, said pressure sensor controlling said pump in response to the pressure existing in said second region.

4,108,047
GEAR CROWNING MACHINE CAM

Walter Frankiw, Detroit, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 514,330, Oct. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 349,226, Apr. 9, 1973, Pat. No. 3,875,847. This application Sep. 12, 1977, Ser. No. 832,388
Int. Cl.[2] B23F *19/06*
U.S. Cl. 90—1.6 R **2 Claims**

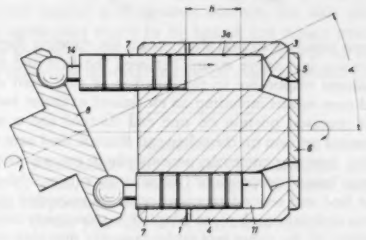


1. A gear finishing machine comprising a frame, a slide movable horizontally on said frame, a gear support table mounted on said slide for reciprocation with said slide and for rocking movement relative to said slide about an axis perpendicular to the direction of reciprocation, camming means for controlling rocking of said table in timed relation to slide travel comprising cam and cam follower devices operatively connected between said frame and said table, one of said devices being carried by said frame and the other of said devices being carried by said table, said cam device comprising an elongated cam bar having opposed parallel camming surfaces and means for angularly adjusting said bar about an axis parallel to the rocking axis of said table, said cam follower device comprising a pair of spaced rollers engageable with one of said parallel surfaces, a second pair of spaced rollers engaging the other of said parallel surfaces in opposing relation to said first mentioned pair of rollers, means for independently adjusting each of the rollers of one pair toward and away from said cam bar to provide precisely controlled engagement by all four of said rolls with said bar to provide precisely identical tilting movement of said table in opposite directions as said table is traversed in opposite directions, said cam bar being adjustable into parallelism with the path of reciprocation of said table to cause said cam bar and rollers to function as the sole means for maintaining said table against tilting during reciprocation thereof.

4,108,048
AXIAL PISTON PUMP OR PUMPING MACHINE

Wilhelm Gauss, Bildechingen; Henrious Van Logten, and Arthur Krüger, both of Horb, of Germany, assignors to Brueninghaus Hydraulik GmbH, Horb am Neckar, Germany

Filed Oct. 27, 1976, Ser. No. 736,268
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1975, 2548730
Int. Cl.[2] F01B *13/04*
U.S. Cl. 91—6.5 **7 Claims**



1. An axial piston pump apparatus defined by a cylinder block with clinders; a distributor plate with kidney-shaped control openings for distributing flow to said cylinders; pistons guided in said cylinders; said cylinder block having channels for releasing liquid pressure in the cylinders within an area between said kidney-shaped control openings; wherein: said channels are arranged in said cylinder block and feed into said cylinders in an area of the cylinder walls; a swash plate connected to said pistons for actuating said pistons in said cylinders, said channels being uncovered by said pistons, and at least two of said channels are arranged at varying distances from said distributor plate in an area of the cylinder walls so that an increasing number of said channels are uncovered by said pistons extend out of said cylinders in response to increased inclination of said swash plate.

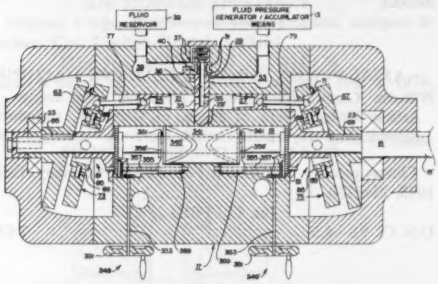
4,108,049
VARIABLE TORQUE FLUID DEVICE

Joseph M. Lawson, P.O. Box 518, Natchez, Miss. 39102

Continuation-in-part of Ser. No. 570,187, Apr. 21, 1975, abandoned. This application Jun. 30, 1976, Ser. No. 701,360
Int. Cl.[2] F01B *13/04*
U.S. Cl. 91—478 **3 Claims**

1. A fluid displacement device comprising:
(a) body means having a plurality of chambers and having first and second port means for allowing a fluid to be introduced into and expelled from said plurality of chambers;
(b) movable means associated with said plurality of chambers for increasing and decreasing the displacement volume of said plurality of chambers;
(c) shaft means operably coupled with said movable means,

(d) fluid distribution means for controlling fluid flow between said plurality of chambers and said first and second port means of said body means, said fluid distribution means including valve means associated with each of said plurality of chambers for movement between a first position allowing fluid to flow between said first port means and at least one of said plurality of chambers and a second position allowing fluid to flow between said second port means and at least one of said plurality of chambers, said fluid distribution means including actuating means for moving said valve means between the first and second positions, said actuating means including a single cam



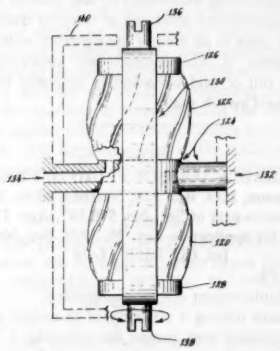
means attached to said shaft means for rotation therewith to move said valve means between the first and second positions responsive to the rotation of said shaft means, said cam means including an elongated cylinder having a first recessed portion on one end thereof and a second recessed portion on the other end thereof, said cam means being laterally movable on said shaft means, said cam means being composed of two separate pieces with one of said first and second recessed portions provided on each piece and with each piece adapted to selectively overlap a portion of the other and to be laterally movable on said shaft means independently of the other.

4,108,050

FLUID-DRIVEN TORSIONAL OPERATORS FOR TURNING ROTARY VALVES AND THE LIKE

Henry M. Paynter, 35 Scotland Rd., Reading, Mass. 01867

Continuation of Ser. No. 497,280, Aug. 14, 1974, abandoned.
This application May 17, 1976, Ser. No. 686,740
Int. Cl.[2] F01B *19/04*
U.S. Cl. 92—48 **5 Claims**



1. A double-acting fluid-driven torsional operator adapted to turn through a predetermined angular operating range comprising;

a fixed frame;

first and second torsional actuators mounted on said frame;

said actuators each including:

first and second flexible, thin-walled elastomeric shells,

said first and second shells defining first and second fluid chambers therein, respectively,

said first and second shells each having first and second coupling members at the opposite ends thereof and being fastened in fluid-tight relationship with the opposite ends of the respective shell,

each of said shells having a longitudinal axis extending through the first and second coupling members at its opposite ends and having a plurality of inextensible, flexible load-bearing strands bonded thereto and extending between and interconnecting the first and second coupling members at opposite ends of the respective shell, and

each respective shell developing an outwardly bowing arcuate shape when fully inflated with said plurality of strands of each shell deflecting into outwardly bowing meridian arcs uniformly spaced about the axis of the shell when the respective shell is fully inflated;

the first coupling member of both of said actuators being fixed to said frame for preventing rotation of both of said first coupling members;

rotatable means interconnecting the second coupling members of both of said actuators for causing said second coupling members to turn simultaneously;

said first and second fluid chambers within the respective first and second shells being separate one from another;

said first and second actuators being pre-twisted in opposite senses with respect to said rotatable means so that fluid admitted into the first of said chambers will exert torque for causing rotation of said rotatable means in a first sense while fluid admitted into the second of said chambers will exert torgue for causing rotation of said rotatable means in the opposite sense;

when said operator is turned to a first limit of said predetermined angular operating range, said shell of said first actuator being twisted about its axis into a fluted configuration with a series of circumferentially spaced ridges and valleys with each strand being twisted about said axis and with the strands of said shell extending along said valleys;

when said operator is turned to a second limit of said predetermined angular operating range, said shell of said second actuator being twisted about its axis into a fluted configuration with a series of circumferentially spaced ridges and valleys with each strand being twisted about said axis and with the strands of said shell extending along said valleys;

means defining a first fluid port for feeding pressurized fluid at pressures P_1 into said first chamber for inflating said first shell for causing said first shell to untwist about its axis and to bow outwardly while partially untwisting the strands thereof,

thereby exerting first torque in a first sense on said rotatable means for angularly moving said rotatable means in said first sense,

means defining a second fluid port for feeding pressurized fluid at pressures P_2 into said second chamber for inflating said second shell for causing said second shell to untwist about its axis and to bow outwardly while partially untwisting the strands thereof,

thereby exerting second torque in a second sense on said rotatable means for angularly moving said rotatable means in a second sense,

by virtue of all of which:

a. the angular position of said rotatable means is proportional to the difference between said pressures P_1 and P_2 throughout said angular operating range, and

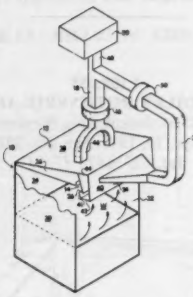
b. the angular position of said rotatable means is stable at any angular position throughout said angular operating range.

4,108,051

VENTILATING SYSTEM FOR INDUSTRIAL MACHINES

Marion L. Eakes, Greensboro, N.C., assignor to Marion L. Eakes Company, Greensboro, N.C.

Division of Ser. No. 683,733, May 6, 1976, Pat. No. 4,050,367.
This application May 9, 1977, Ser. No. 794,718
Int. Cl.[2] F23J 11/00
U.S. Cl. 115 LH 5 Claims



1. Ventilating system for industrial machines of the type carrying out a process on a work table at which a substantial amount of contaminated exhaust gases are generated, said system comprising:

a. an exhaust means positioned above and spaced from the work table and having at least one partially open side;

b. said exhaust means including a hood extending over and covering the area above said work table, said hood including:

i. an upper wall having at least one first conduit means extending therefrom through which the contaminated exhaust gases exit from said hood;

ii. a lower wall having at least one inlet therethrough generally parallel to and generally coextensive with said open side through which said contaminated exhaust gases enter said hood;

iii. a front plenum portion of said exhaust hood including an air nozzle slightly in front of and below said inlet and directed toward said inlet;

iv. said hood means otherwise enclosed from the atmosphere therearound;

c. a second conduit means connecting said first conduit means and said front plenum portion;

d. a gas separating means in said first conduit means downstream of the point where said second conduit means is connected;

e. separating means in said first conduit means upstream of said gas separating means for separating a portion of said contaminated exhaust gases and sending a first portion thereon into said second conduit means and the second portion thereof on to said filtering means; and

f. fan means for applying negative pressure to said inlet and directing said contaminated exhaust gases into and through said first and second conduit means.

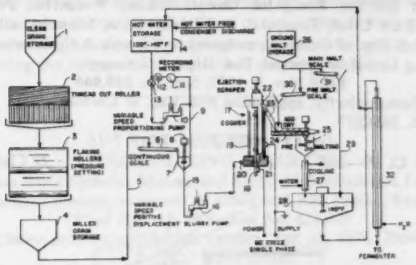
4,108,052

APPARATUS FOR PRODUCING ALCOHOL FROM GRAINS OF STARCH MATERIALS

Newton T. Cunningham, 1324 Garfield Ave., Wyomissing, Pa. 19610

Continuation-in-part of Ser. No. 637,865, Dec. 4, 1975, Pat. No. 4,035,515. This application Apr. 21, 1977, Ser. No. 789,702
Int. Cl.[2] A23L 1/00; C12C 11/00
U.S. Cl. 99—275 4 Claims

4. An apparatus for producing ethyl alcohol from cereal grains, said apparatus comprising; means for cutting and breaking certain grain into small fragments; means for continuously adding water at a temperature of about 120° to 140° F to the said grain fragments so as to form a water slurry thereof; a holding vessel for retaining said grain slurry; a cooking unit; means for passing said slurry into said cooking unit; said cooking unit having a central electrode positioned within an electrically conductive outer cylindrically shaped wall forming a chamber around said central electrode, said central electrode and outer cylindrical wall having first and second end portions respectively; support means positioned at the first ends of said



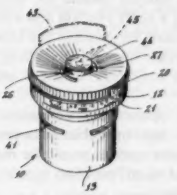
central electrode and cylindrical outer wall for supporting same; a power source connected across said central electrode and said outer conductive wall whereby the electrical path for said power source is completed through the said slurry to thereby cause said slurry to be heated and means positioned near the second end of said outer conductive wall for collecting and removing the resulting gelled mash from said cooking unit.

4,108,053

VARIABLE BREW COFFEE MAKER

Richard C. Vink, Essex, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,418
Int. Cl.[2] A47J 31/10
U.S. Cl. 99—306 6 Claims



1. A drip coffee maker operable with a supply of heated water, a quantity of ground coffee, and a brewed-coffee receptacle, which includes a variable-strength coffee-brewing assembly removably placeable atop said receptacle and comprising a brewing basket defining a brewing space for containing said ground coffee and an overflow duct by-passing said brewing space, a water-spreader container removably attached atop the brewing basket and defining a water-collection space and an overflow chamber, a water-distribution plate atop said water-spreader container, said water-distribution plate being provided with first and second apertures, and valve means for variably blocking water flow through each of said apertures, said valve means comprising a port of said water-spreader container positionable in adjacent and blocking relationship with said apertures, and said water-distribution plate being movable relative to said water-spreader container for effecting said variable blocking, said water-distribution plate, said water-spreader container and said brewing basket being longitudinally alignable, whereby heated water received by said water-distribution plate flows proportionately, as controlled by said valve means, (i) through said first aperture, said overflow

chamber, and said overflow duct into said receptacle, and (ii) through said second aperture, said water-collection space, and said brewing space into said receptacle to provide brewed coffee of the desired strength.

4,108,054

SAFETY INTERLOCK DEVICE IN AN ELECTRICALLY DRIVEN HOUSEHOLD MIXING APPARATUS

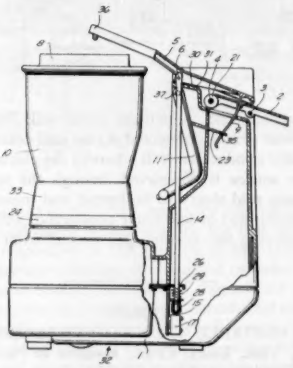
Ingo Klöcker, Ennepetal; Oswald Gibiec, Wuppertal; Paul-Ulrich Uibel, Ennepetal, and Dieter Garn, Schwelm, all of Fed. Rep. of Germany, assignors to Vorwerk & Co Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 849,966

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651237

Int. Cl.[2] A47J *27/18*; B01F *7/16*

U.S. Cl. 99—348 **22 Claims**



1. In an electrically driven household mixing apparatus having a housing, a drive motor located in the housing and having an electric circuit means for operating the motor, a container including a body portion and a removable cover, and a heating arrangement for heating the container and having a further electric circuit means for sensing and controlling the temperature of the container, a safety interlock device comprising

a safety switch operatively connected with said electric circuit means and movable between an on position in which it permits operation of the motor and heating arrangement and an off position in which it does not permit such operation;

a switching rod mounted for longitudinal movement between a switch-on position causing said switch to move to its on position, and a switch-off position causing the switch to move to its off position;

a holding lever pivotally mounted on said switching rod and having an end portion, said holding lever being turnable between a closed position in which said end portion abuts against the cover when the latter is present, and an open position in which said end portion is withdrawn from the cover;

an arm provided with a temperature sensing element operatively connected with the further electrical circuit means of the heating arrangement, and movable between a proximal position in which said temperature sensing element contacts a wall of the container so as to sense the temperature of the latter, and a distal position in which said temperature sensing element is withdrawn from the wall of the container;

an actuating lever mounted for pivotal movement between a first position in which it keeps said holding lever in said closed position and through the intermediary of said holding lever keeps said switching rod in the switch-on position thereof and a second position in which the actuating lever does not keep the holding lever in its closed position and does not keep the switching rod in its switch-off position;

and a transmission element mounted on said actuating lever and operative when the latter is moved to its first position for moving said arm with said sensing element to its proximal position.

4,108,055

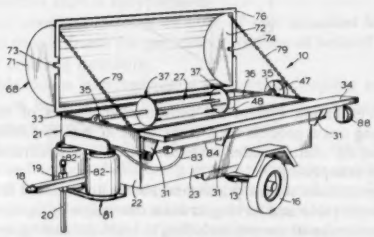
MOBILE BROILER ROTISSERIE APPARATUS

James Simmons, 5225 St. Joseph Ave., Stevensville, Mich. 49127

Filed Apr. 14, 1977, Ser. No. 787,580

Int. Cl.[2] A47J *37/04*

U.S. Cl. 99—421 H **4 Claims**



1. A mobile broiler rotisserie apparatus, comprising:

trailer frame means including road engaging wheel means and hitch means for connection to a vehicle;

an open top chamber having sidewalls and a bottom wall mounted on said trailer frame means, said chamber including support means adjacent the upper edge of a pair of sidewalls to the open top chamber;

rotatable food supporting means rotatably supported on said support means in spaced relation from said bottom wall of said chamber;

controllable heat generating means positioned in the spacing between said food supporting means and said bottom wall for cooking foods supported on said food supporting means;

hood means pivotally secured to an upper edge of said open top chamber and movable between open and closed positions relative to said open top of said chamber means;

elongated trough means mounted in said chamber and above said controllable heat generating means and in vertical alignment with said rotatable food supporting means, one of said walls of said chamber having an opening therein, the longitudinal axis of said trough means extending parallel to the axis of rotation of said rotatable food supporting means and at an incline to the horizontal downwardly out through said opening in one of said walls of said chamber, said trough means occupying the range of 15 to 25 percent of the width of said chamber viewed in a direction parallel to said axis of rotation; and

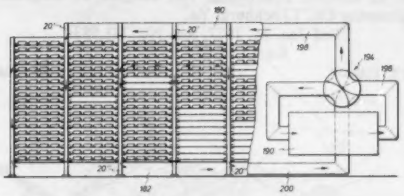
drive means operatively connected to said rotatable food supporting means and having a rotatable output characteristic in the range of 0.5 to 1.0 rpm whereby the juice from foods mounted on said rotatable food supporting means will fall therefrom during cooking and into said trough means and whereby the heat from said heat generating means will maintain the collected juice in said trough means in liquid form so that it will flow down the incline of said trough means and out through said opening for external collection.

4,108,056

APPARATUS FOR STORING CHEESE LOAVES AND FOR PERIODICALLY TURNING THEM UPSIDE DOWN

Gerrit Jan Van Elten, Barneveld, and Antonius Hurkmans, Baarn, both of Netherlands, assignors to Tech. Ontwikkelingsbureau Van Elten B.V., Netherlands

Continuation of Ser. No. 571,088, Apr. 24, 1975, Pat. No. 4,015,519. This application Jan. 25, 1977, Ser. No. 762,469
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2421515
Int. Cl.[2] A01J *25/16;* A23B *4/08*
U.S. Cl. 99—452 5 Claims



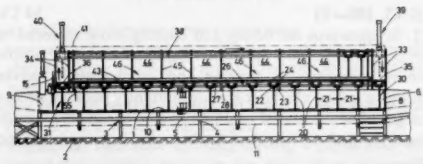
1. An apparatus for storing cheese loaves comprising an array of adjacent units, each unit constituting a multiplicity of horizontal open-end guideways in super-imposed relationship, each guideway accommodating loaves of cheese, the height of each guideway being in excess of the height of each loaf, each unit having opposite hollow walls extending parallel to said guideways, air-circulating means supplying and withdrawing air to and from the individual units for control conditioning of the cheese within said units, such air circulating means including a fan and air-ducting means for supplying air through one of said walls of each unit and withdrawing air from the other one of said walls of each unit, respectively, the air-conducting means including air outlet openings and air suction openings distributed all over the walls of the unit, the opposite hollow walls of at least some of said units having internal longitudinal partitions subdividing the internal space of said hollow wall into a pair of ducts, each of which communicates with some of said air outlet and suction openings, conducting means establishing communication from each of said ducts with said air circulating means, said conducting means including adjustable control valves.

4,108,057

DEVICE FOR CONTINUOUS PRODUCTION OF CHEESE MATERIAL

Gottfried Hain, Lehen; Günter Dohle; Josef Geist, both of Rott, Inn, and Rainer Schmidt, Lehen Nr. 5, all of Fed. Rep. of Germany, assignors to Alpma Alpenland Maschinenbau Hain and Co. K.G., Fed. Rep. of Germany

Filed Jan. 28, 1976, Ser. No. 652,949
Int. Cl.[2] A01J *25/16;* A23C *19/02*
U.S. Cl. 99—452 9 Claims



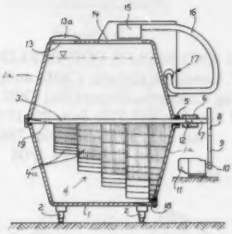
1. A device for continuous production of cheese material through coagulation of milk comprising a horizontal trough-shaped container having edges and an inlet end and an outlet end, a flexible inner wall covering the container wall on the inside, which inner wall forms an endless band around the edges of the container, means feeding milk to the inlet end of the container, drive means urging the forward movement of the flexible inner wall at such a velocity that the milk coagulates on its way from the inlet end to the outlet end of the container, cutting means for the coagulate at the outlet end of the container, whereby said coagulate in the form of cut cheese curd is removed by the inner wall on the outlet side, partitions corresponding to the cross section of the container which are horizontally spaced in relation to each other, a rail guide for the partitions, means for lowering the partitions into the container at the inlet end, means for lifting the partitions from the container at the outlet end in front of the cutting device, and a return rail guide for the partitions, said return rail guide connecting the lifting means with the lowering means.

4,108,058

CHEESE-MAKING APPARATUS

Claes Bertil Sjoholm, Malmo, and Karl J. G. Martensson, Lund, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Apr. 12, 1976, Ser. No. 676,070
Claims priority, application Sweden, Apr. 18, 1975, 7504503
Int. Cl.[2] A10J *25/06*
U.S. Cl. 99—466 16 Claims



1. Cheese-making apparatus comprising an immobile container for cheese curd, said container being in the form of a body of revolution having an axis, a tool movable within the container and having cutting means and separate stirring means for cutting and subsequent stirring of cheese curd, and a drive shaft connected with the tool and arranged to rotate the tool about said axis of the container, said apparatus being characterized in that the immobile container is disposed with its said axis substantially horizontal and that said tool is arranged to cut and stir cheese curd situated above as well as below said axis of the container, said apparatus comprising also driving means for rotating said shaft and tool through a plurality of revolutions during a cutting operation and then through another plurality of revolutions during a stirring operation.

4,108,059

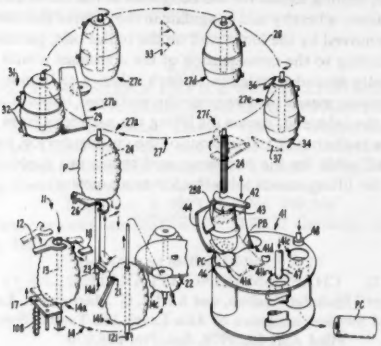
METHOD AND MEANS FOR PEELING PINEAPPLES

Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Filed Jun. 21, 1976, Ser. No. 697,779
Int. Cl.[2] A23N *4/20, 7/00*
U.S. Cl. 99—543 39 Claims

1. In a pineapple peeler, means for positioning a pineapple with its core axis extending in a predetermined direction, pineapple moving means adjacent the positioning means to engage and move the pineapple along a path in alignment with said direction, pineapple coring means in a position to receive the pineapple and to cut a hole axially and centrally through the core of the pineapple, yielding means adjacent the coring means to engage the pineapple while it is being cored and yieldably resisting movement of the pineapple in said direction, and disengaging means to disengage the pineapple moving means from the pineapple whereupon said yielding means

moves the pineapple relative to said coring means in a direction opposite to said direction, thus spacing an end of the pineapple



from the coring means to enable cutting of said end from the pineapple.

4,108,060

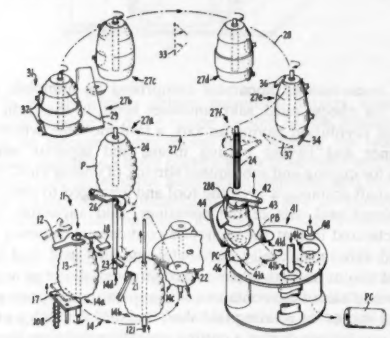
METHOD AND MEANS FOR PEELING PINEAPPLES

Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Division of Ser. No. 697,779, Jun. 21, 1976. This application Apr. 11, 1977, Ser. No. 786,615

Int. Cl.[2] A23N *7/08*

U.S. Cl. 99—591 **9 Claims**



1. A rotary cutter for peeling pineapples and the like comprising: a movable mounting head for supporting the cutter, a circular disc supported centrally on a shaft which is mounted on said mounting head, said disc having a plurality of teeth disposed about the periphery of the disc having at least the leading edge thereof sharpened to provide a cutting surface, said disc having a concave face opposite the shaft wherein said peripheral teeth cut an ovoid shaped path through the outer layer of the pineapple, and at least one upstanding spur disposed on the disc on the side opposite said concave face and substantially normal to the disc and having a sharp leading edge to cut the peeled material into segments, a pair of gauge shoes connected to said mounting head, one gauge shoe being disposed on each side of said cutter periphery for limiting the depth of penetration of the cutter teeth into said fruit surface as the pineapple is indexed into the cutter station, said gauge shoes each including bar members connected to said mounting head for movement therewith and having a recess defined therein adjacent said circular disc, flexible members attached to said bar members adjacent said recesses for engaging the fruit which conform to the shape of the fruit so that said gauge shoes contact the fruit over an enlarged surface area, said flexible members extending across said bar member recesses to form a cradle which conforms to surface irregularities of a pineapple, said guage members contacting incoming fruit to move said mounting head and said cutter in accordance with the size and shape of that incoming fruit whereby the cutter encounters the fruit to be peeled at a desired depth and attitude.

4,108,061

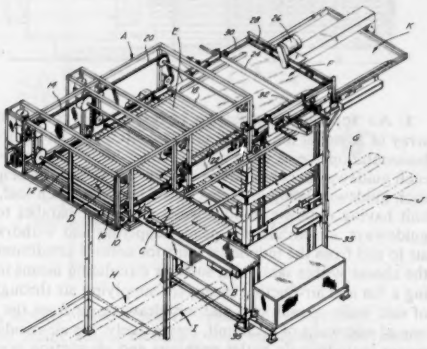
PALLETIZER WITH TIER SHEET INSERTER AND BANDING MEANS

Robert E. Bowser, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Jan. 24, 1977, Ser. No. 761,583

Int. Cl.[2] B65B *13/14*

U.S. Cl. 100—7 **23 Claims**



1. In a palletizer of the type having a hoist shaft, a hoist, means for moving said hoist within said shaft, a retractable draw plate located above said shaft and means for forming a set of objects to be palletized and for positioning same on said draw plate, when said draw plate is in the unretracted position, the improvement comprising means associated with said shaft at a point below said draw plate for strapping said set of objects together, said hoist moving means being effective, when actuated, to move said hoist to a position wherein said set of objects is aligned with said strapping means, after the retraction of said draw plate.

4,108,062

APPARATUS FOR BINDING A CROP BALE

Allen A. White, Peabody, Kans., assignor to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 742,178, Nov. 16, 1976, Pat. No. 4,074,623. This application Sep. 15, 1977, Ser. No. 833,566

Int. Cl.[2] B65B *13/28*

U.S. Cl. 100—11 **14 Claims**

1. In apparatus for baling and binding loose material into a compacted bale, said apparatus being of the type wherein a bale is progressively formed and incrementally advanced through a baling chamber by intermittently packing successive charges of new material against a source of yieldable resistance across the path of travel of the bale, the improvement including:

a pair of separate binding strands and a pair of separate respective sources of supply therefor;

a tier positioned alongside the path of travel of the bale; and

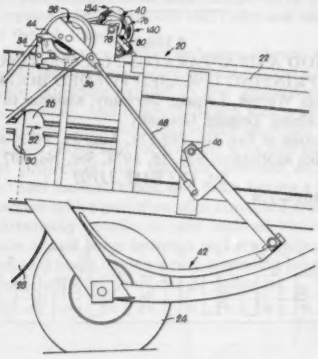
mechanism for presenting the strands in unison to said tier before and after the packing cycle of each bale, respectively,

said tier being operable twice during the binding of each bale to connect the strands together into a complete loop about

the bale having a pair of points of connection of the strands,

said mechanism and said tier being cooperable before the start of a packing cycle to connect the strands together a first time and form an open-ended bight from the strands that extends across the path of travel of the bale in position to receive the charges thereof,

said sources of supply being operable to pay out additional



lengths of both strands simultaneously as said bight is thereafter lengthened by the forming and advancing bale,

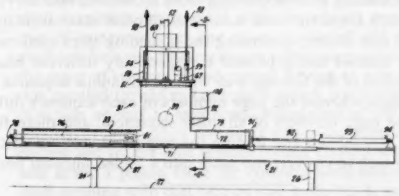
said mechanism and said tier being further cooperable after the completion of a packing cycle to close the bight and connect the strands together a second time whereby to complete the loop about the bale, the second connecting of strands for one bale and the first connecting of strands for the next succeeding bale being carried out successively.

4,108,063

HYDRAULIC BAGGING PRESS

Arthur J. Randolph, 4711 Sonoma Hwy., Santa Rosa, Calif. 95405

Filed Sep. 19, 1977, Ser. No. 834,714
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—53 **8 Claims**



1. A hydraulic bagging press comprising

a vertical hydraulic cylinder having a perforated ram slidably engaging walls of a vertical chamber for compressing material disposed therein,

screw feed means feeding divided material into said vertical chamber below said ram therein,

A horizontal hydraulic cylinder having a perforated horizontal ram slidably engaging the walls of an open-ended chamber disposed across the bottom of said vertical chamber and communicating therewith whereby said vertical ram compresses material into said horizontal chamber,

a hydraulic operated back-up plate mounted for controlled movement toward and away from the open end of said horizontal chamber for controllably holding a bag about the open end thereof,

said horizontal ram being moveable to compress said material into the open end of said horizontal chamber against a bag end held thereat by said back-up plate and further moveable with said back-up plate to remove a bag with compressed material therein, and

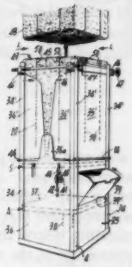
exhaust means communicating with each of said rams on the sides thereof toward the respective cylinders for withdrawing air and entrained particles of said material from said press.

4,108,064

FEEDING APPARATUS FOR DEVICE FOR FORMING BALES OF INCOHERENT MATERIAL

Giorgio Ceribelli, Via Privata Pienza, 18, Milan, Italy (20142)

Division of Ser. No. 523,374, Nov. 12, 1974, Pat. No. 3,998,147.
This application Mar. 29, 1976, Ser. No. 671,443
Claims priority, application Italy, Nov. 16, 1973, 31481 A/73; Sep. 4, 1974, 26922 A/74
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—187 **4 Claims**



1. An apparatus for compressing material comprising: a hollow chamber defined by a plurality of walls, at least two of the walls being opposite and spaced apart from each other, a piston-plate, means for moving the piston-plate in the chamber between maximum inner and outer limits, a hopper in one of the walls located between the two maximum limits of movement of said piston-plate through which material can be introduced into the chamber, a plurality of engaging means located at the maximum outer limit of the piston-plate for engaging said compressed material and stopping rearward movement thereof, adjusting means for adjusting the distance between portions of the opposite walls located beyond the outer limit of the piston-plate, each wall including first and second portions, the first portions of adjacent walls being connected to each other, the second portions of the opposite walls being hinged to their respective first portions, a pair of adjustable tie-rods connected at the outer end of said opposite walls for adjusting and maintaining the distance therebetween, said hinged first portions of the walls being provided on both sides with symmetrical semi-walls for forming the second portions of the other walls, the first portions of the other walls each including an upward extension located outwardly of the semi-walls for holding the latter in place.

4,108,065

CAN COMPACTOR

Harold Victor Unger, Greenville, Ohio, assignor to Treaty Products Incorporated, Greenville, Ohio

Filed Dec. 27, 1976, Ser. No. 754,118
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—215 **2 Claims**

1. In a can compactor, the combination comprising

a frame,

a generally vertical anvil mounted in said frame,

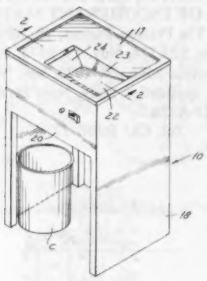
a base plate,

a ram movable horizontally toward and away from said anvil,

means for moving said ram toward and away from said anvil,

and means for guiding said cans comprising a generally horizontal imperforate top panel having a bottom wall portion inclined downwardly and inwardly from one edge beyond the center of said top panel and terminating in an opening spaced from the ram,

said inclined portion guiding cans for rolling movement toward the anvil,



means associated with said ram to define a stop for a row of cans rolling toward said ram,

said means defining a stop including an inclined top wall extending downwardly and rearwardly from said ram,

said top wall terminating below the upper edge of the ram whereby the upper edge of the ram defines said stop,

said inclined top wall of said ram including a secondary stop to further prevent rearward movement of the cans along said inclined top wall,

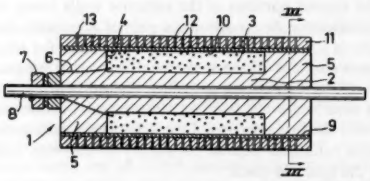
and means for retaining the can in the space between said anvil and said ram to permit said ram to be moved and thereby compact the can.

4,108,066

DEVICE FOR PRINTING BRAILLE

Lars-Eric Andersson, 91 A Nygatan, Skelleftea, Sweden (S-93100)

Filed Dec. 16, 1976, Ser. No. 751,331
Claims priority, application Sweden, Dec. 30, 1975, 7514768
Int. Cl.[2] B44B *5/02*; B41J *3/32*
U.S. Cl. 101—22 **2 Claims**



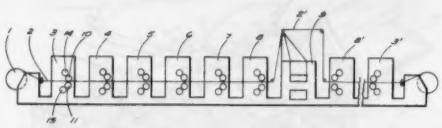
1. A device for printing Braille, said device comprising a magnetizable core, an outer layer on said core provided with holes arranged in a pattern for composing a text to be printed, pins of a magnetizable material, an inner layer of magnetizable material inside said outer layer and covering the holes therein, said pins being of greater length than the thickness of said outer layer and being adapted upon contact with the magnetizable material to be attracted thereto and thereby to remain in their respective holes, said magnetizable core and inner and outer layers forming a roller, said outer layer being constituted as a sleeve fitted on said inner layer for common rotation therewith, said holes in the outer layer extending radially in said sleeve, said core including two end portions between which is a depression, an electrical winding in said depression to magnetize said core, the outer layer being of a non-magnetizable material having ends affixed to said core, the magnetizable core being an electromagnet, said core, inner layer and outer layer being substantially coextensive in length, an axle coaxially mounted in and rotatably supporting said core, and a slip ring on said axle and coupled electrically to said winding.

4,108,067

METHOD AND APPARATUS FOR CONTINUOUSLY PRINTING UNCASED FOLDED BOOKS

Hans-Dieter Werner, Leipzig, Germany, assignor to Veb Polygraph Leipzig, Leipzig, Germany

Continuation of Ser. No. 285,521, Aug. 31, 1972, abandoned.
This application Sep. 18, 1974, Ser. No. 507,300
Int. Cl.[2] B41F *13/02*
U.S. Cl. 101—224 **2 Claims**



1. A method of producing folded uncased books in a continuous operation, comprising the steps of advancing an imprintable web continuously through a plurality of successively arranged book-page printing stations, so that spaced incremental blank web sections of identical length become successively located at the respective stations; engaging a first blank web section of the moving web at one of said stations with a plate cylinder which imprints it with a first continuous sequence of book pages having a first starting page number and a first terminal page number, while refraining from imprinting those sections of said moving web which are at this time located at the other stations; engaging a different second blank web section of the moving web at a book-page printing station following said one station with another plate cylinder which imprints it with a second continuous sequence of book pages having a second starting page number which follows said first terminal page number and also having a second terminal page number, while refraining from imprinting those sections of said moving web which are at this time located at all other stations including said one station; continuing the preceding steps until each of said stations has imprinted a respectively different blank web section of the moving web with a continuous sequence of book pages wherein the page numbers of each sequence differ from the page numbers of all other sequences; and thereafter cutting, assembling and folding the imprinted sections of the moving web to convert the latter into a folded uncased book.

4,108,068

INK AGITATOR

Gerard Edouard Lambert, Saint-Cloud, and Roger Begis, Chaville, both of France, assignors to Seveg, S.A., Sevres, France

Continuation of Ser. No. 686,455, May 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 549,324, Feb. 12, 1975, abandoned. This application Apr. 28, 1977, Ser. No. 791,688
Claims priority, application France, Feb. 12, 1974, 74 04603
Int. Cl.[2] B41F *31/02*
U.S. Cl. 101—363 **4 Claims**

1. In an ink agitating apparatus for ink fountains of printing machines, the combination comprising:

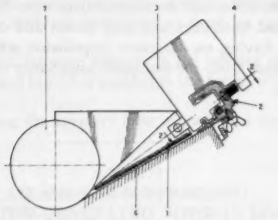
an elongated ink fountain having an inclined blade defining a bottom wall of the ink fountain and an ink roller mounted tangential to the bottom portion of the blade for rotation on a longitudinal axis of said ink fountain;

a replaceable ink agitator device adapted to be removably mounted above said ink fountain;

means providing a support for said replaceable ink agitator device adjacent the top portion of said blade;

said ink agitator device including a self-driven mobile assembly including an ink agitator in the form of a tapered elongated element rotatable about its longitudinal axis and operable to agitate ink in said ink fountain when located adjacent said inclined blade with its tapered tip projecting into a crevice formed between said roller and said bottom wall of the ink fountain;

said ink agitator device further including a beam, means for removably fastening said beam on said support means with said beam extending parallel to said longitudinal axis of said ink fountain, said beam including means providing a guide track for supporting said mobile assembly for linear displacement along said ink fountain with said ink agitator element projecting into said ink fountain and located adjacent said inclined blade, said beam having a U-shaped cross section with a pair of parallel arms, said arms extending substantially parallel to said inclined blade and the open side of said beam between said arms facing said ink fountain, said beam having a rack extending lengthwise of said beam on the inside of one of said arms;



said mobile assembly including a reversible motor, drive means connecting said motor to rotate said agitator element including an agitator shaft supporting said agitator element and extending parallel to said arms through said open side and between said arms into the hollow of said beam, means in rolling engagement with both said arms for supporting said mobile assembly for linear displacement along said beam, said assembly supporting means including a pair of spaced rollers carried by said agitator shaft in rolling engagement with one of said arms and a pair of casters carried one on each side of said agitator shaft in a fore-and-aft direction in rolling engagement with the other of said arms, said casters having an axis of rotation parallel to said agitator shaft which is adjustable in a direction normal to said arms, adjustment of the axis of rotation of said casters providing means for adjusting said casters and rollers into smooth rolling contact with both said arms, a pinion fixed for rotation with said agitator shaft meshing with said rack on said guide track, and drive means connecting said motor to rotate said pinion for both rotating said agitator and linearly displacing said assembly along said track.

4,108,069

ON-PRESS PRINTING PLATE LOCKING SYSTEM

Fred W. Standiford, 22577 Margarita Dr., Woodland Hills, Calif. 91364

Continuation-in-part of Ser. No. 130,090, Apr. 1, 1971. This application Mar. 16, 1973, Ser. No. 342,186

Int. Cl.[2] B41F *27/12*

U.S. Cl. 101—415.1 **7 Claims**

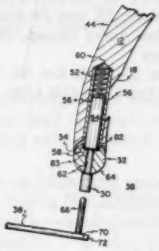
1. An on-press flexible printing plate locking system for printing press saddles which are semicylindrical in shape and have first and second opposite longitudinal side edges which are substantially parallel to the axis of the cylinder of a rotary printing press and are adapted to be secured to the outside surface of said cylinder, and which are capable of supporting a thin flexible printing plate on the outside face of said saddle, said locking system comprising:

securing means attached to and positioned along said first longitudinal side edge of said saddle for securing a first side edge of said thin flexible printing plate to said saddle while said saddle is attached to said cylinder of said press;

a support member journaled to and positioned along said second longitudinal side edge of said saddle by journal means;

a plurality of outwardly extending register pins secured to said support member and positioned to register with pin openings formed along a second side edge opposite said first side edge of said flexible printing-plate;

locking means for locking said support member in a printing-plate-secured position in which said thin flexible printing plate is secured to said saddle, said locking means being comprised of a spring loaded slug located internally in the structure of said saddle and at least one notch formed in said support member to be opposite said spring loaded slug when said support member is in said printing-plate-secured position, said notch substantially conforming to the cross-sectional dimensions of said slug and shaped to



receive a portion of said slug so that when said support member is rotated to said printing-plate-secured position said slug is urged by said spring into said notch;

rotation tool means which is mechanically applied to said support member to impart rotational torque to said support member to secure said flexible printing plate to said saddle with said saddle attached to said cylinder, said rotation tool means having at least one edge with pin openings formed therealong which register with said register pins secured to said support member when said rotation tool is mechanically applied to said support member so that rotational torque may be imparted to said support member via said pins;

an unlatching pin hole which is smaller in cross section than said notch and which extends from said notch through the center of said support member to the surface of said support member opposite said notch; and

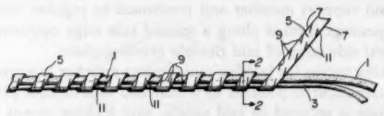
an unlatching pin substantially conforming to the dimensions of said unlatching pin hole and positioned along said edge of said rotation tool means to coact with said unlatching pin hole to allow said slug to be forced out of said notch upon application of said tool means to said support member for removing said thin flexible printing plate.

4,108,070

EXPLOSIVE OBSTACLE WIRE

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Continuation-in-part of Ser. No. 757,201, Jan. 6, 1977, which is a continuation-in-part of Ser. No. 676,067, Apr. 12, 1976, Pat. No. 4,015,506. This application Jul. 20, 1977, Ser. No. 817,196
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] F42B *23/00*; E04H *17/04*
U.S. Cl. 102—8 14 Claims



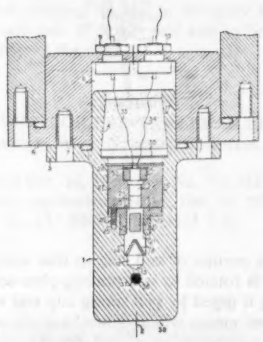
1. An explosive obstacle wire comprising: an explosive cord; a strip wrapped around said cord, said strip including portions adapted for deformation outwardly to a hazardous configuration; and a strand positionally adapted for supporting said cord and said strip; whereby initiation of said cord can deform said portions outwardly to said hazardous configuration.

4,108,071

CUTTING DEVICE HAVING A SHAPED CHARGE IN A CAVITY OF REVOLUTION

Georges Joseph Nabúcet, 19, rue du Gué Fleuri, Le Relecq Kerhuon, and Michel André Champ, 35 rue Erwan Marec, Brest, both of France

Filed Jun. 22, 1976, Ser. No. 698,797
Int. Cl.[2] F42B *3/08*
U.S. Cl. 102—24 HC 8 Claims



1. A device having a shaped charge comprising a cone-shaped liner generating a planar perforating jet, said charge being provided with a cavity of revolution and comprising a body having relatively high mechanical resistance in which is provided a blind hole of revolution comprising at the bottom a first cylindrical-conical portion having a first bore, above the said first portion, a second and a third portion serving to support a member of revolution having two cylindrical channels opening, on the one hand in the second portion and on the other hand in a tube provided in the said member, the channels being symmetrical with respect to the common axis of the blind hole and the cone-shaped liner, the tube, the channels and the second portion above the cone-shaped liner being filled with explosive which can be the same as that constituting the charge whose cone-shaped liner is its lining, the tube being surmounted by a detonator, the plane of the two channels defining the direction of the cutting jet generated by the detonation of the shaped charge.

4,108,072

ARMOR-PIERCING PROJECTILE HAVING SPACED CORES

Walter Louis Adolf Trinks, Rhöndorf, and Wolfgang Ferdinand Struth, Weil am Rhein, both of Fed. Rep. of Germany, assignors to Deutsch-Franzosisches Forschungsinstitut, St. Louis, France

Filed Dec. 27, 1965, Ser. No. 517,188
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1964, 1428679
Int. Cl.[2] F42B *13/06*
U.S. Cl. 102—52 12 Claims

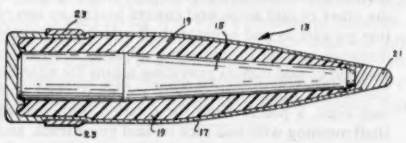
1. An armor-piercing projectile comprising a hard-core having armor-piercing properties, means axially spaced a substantial distance in front of said core and capable of piercing an armor plate to form an opening therein of sufficient size to enable substantially unimpeded passage of said hard-core through said armor plate to a second armor plate to be pierced by said hard-core, and an intermediate layer filling the space between said hard-core and said means and constituted of a substance, having an accoustic impedance which is substantially different from the accoustic impedance of said core and said means.

4,108,073

ARMOR PIERCING PROJECTILE

Dale M. Davis, Freeport, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 27, 1975, Ser. No. 553,854
Int. Cl.[2] F42B *13/04*
U.S. Cl. 102—52 2 Claims



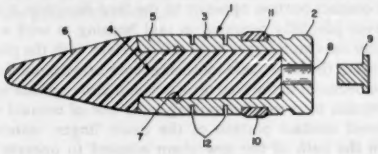
1. An armor piercing projectile suitable for firing through a rifled gun bore, said projectile comprising, a long thin penetrator core element having a tapered forward portion, a monocoque jacket substantially surrounding said core and in spaced relation thereto, a rigid inert filler material disposed between said core and said jacket for supporting said core throughout substantially all of its length, and centering means including a separate nosepiece insertable into the open forward end of said jacket and engaging the forwardmost portion of said core for holding said core in the central area of said projectile, the rearwardmost portion of said core engaging the base portion of said jacket thereby providing the required strength, rigidity and mass properties to said projectile during acceleration through the gun bore while at the same time providing for superior penetration against specific targets.

4,108,074

FRANGIBLE TARGET PRACTICE PROJECTILE

Rudolph W. Billing, Jr., Littleton, and Charles M. Conlon, Jr., Andover, both of Mass., assignors to Avco Corporation, Wilmington, Mass.

Filed Apr. 27, 1977, Ser. No. 791,216
Int. Cl.[2] F42B 9/20
U.S. Cl. 102—92.7 9 Claims



1. A combination steel and plastic projectile for a round of ammunition used in target practice comprising:

a cylindrical steel cup having an open interior cavity therein defined by side and botton walls, said bottom wall having an aperture constructed therein to allow the release of hot gases therefrom;

a plastic nose element injection molded into the cup and extending outward therefrom to form an ogive for the projectile;

means to lock the nose element in the interior cavity;

a rotating band injection molded to the periphery of the cup; and

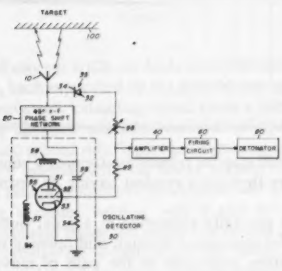
means to plug the aperture after assembly of the projectile.

4,108,075

MEANS FOR SUPPRESSING OSCILLATOR-GENERATED NOISE IN DOPPLER PROXIMITY FUZES

Wilbur S. Hinman, Jr., Arlington, Va.; Helmut Sommer, Bethesda, and Louis M. Tozzi, Takoma Park, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 9, 1959, Ser. No. 805,348
Int. Cl.[2] F42C 13/04
U.S. Cl. 102—214 4 Claims



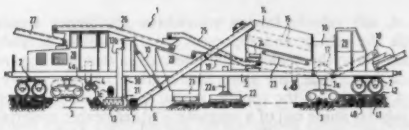
1. In a doppler proximity fuzing system including an oscillating detector providing diode detection, an antenna to which the output of said oscillating detector is coupled, and an amplifier to which the detected signal from said oscillating detector is fed, the improvement comprising means for suppressing oscillator-generated noise, said means including a 45° r-f phase shift network connected between the output of said oscillating detector and said antenna, diode detection means connected to said antenna and poled oppositely to the diode detection provided by said oscillating detector, the detected signal from said diode detection means being fed to said amplifier along with the detected signal from said oscillating detector, and means to which at least one of said detected signals is fed prior to application to said amplifier for adjusting the magnitude of the detected oscillator-generated noise appearing in one of said detected signals to be substantially equal to the magnitude of the detected oscillator-generated noise appearing in the other of said signals.

4,108,076

METHOD FOR REMOVING BALLAST FROM RAILROAD TRACKS

Fritz Knape, Mainzer Strasse 18, 8000 Munich 40, Fed. Rep. of Germany

Filed Nov. 3, 1976, Ser. No. 738,611
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 2550391
Int. Cl.[2] E01B 27/06
U.S. Cl. 104—2 5 Claims



1. A method of removing ballast from a railroad track having first, second, and third consecutive sections, the track in each section including rails and ballast under the rails which method comprises:

(a) removing said rails from said second section;

(b) placing a car on said first section,

(1) the car carrying a digging conveyor and drive means for the conveyor,

(2) the car including rail engaging wheels transmitting at least a portion of the weight of the placed car to the rails of said first section;

(c) passing said conveyor through the ballast under the engaged rails of said first section and over said car in a closed loop, whereby said conveyor is partly embedded in said ballast;

(d) moving said car on said track in a direction from said first section toward said third section until a part of said car is located above the ballast of said second section;

(e) transferring said portion of said weight from said rail engaging wheels to a cross country vehicle supporting said part of the car and movably engaging the ballast of said second section;

(f) further moving said car in said direction while supported on said vehicle until said wheels are located above said third section;

(g) engaging said wheels with the rails of said third section and transferring said portion of said weight from said vehicle to the engaged wheels;

(h) additionally moving said car in said direction;

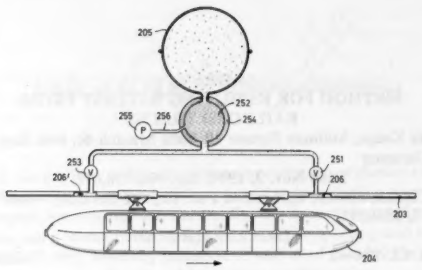
(i) keeping said conveyor, while extending in said closed loop, partly embedded in said ballast during said moving, said further moving, and said additionally moving of said car until said conveyor engages the ballast of said third section; and

(j) driving said conveyor in said loop during said moving, said further moving, and said additionally moving, whereby ballast is removed from each of said first, second, and third sections.

4,108,077
RAIL VEHICLES WITH PROPULSION ENERGY RECOVERY SYSTEM

Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen bei Stuttgart, Fed. Rep. of Germany

Filed Jun. 9, 1975, Ser. No. 585,366
Claims priority, application Austria, Jun. 7, 1974, 4720/74; Aug. 6, 1974, 6411/74
Int. Cl.[2] B61B *13/12*
U.S. Cl. 104—156 7 Claims

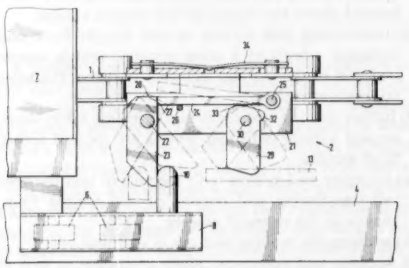


1. A rail vehicle having propulsive machinery arranged outside the vehicle and apparatus for transmitting propulsive momentum to the vehicle, characterized in that said apparatus acts on the vehicle only along the length of path necessary for the acceleration of the vehicle, in that the vehicle is supported by a tubular guide rail of a magnetically permeable material, in that a piston structurally connected to said vehicle and containing magnetic elements is slidable within said tubular guide rail to make a linear magnetic coupling with said guide rail, and in that compressed air is utilized to propel the piston during the acceleration phase of the vehicle and where the piston serves to compress air during the deceleration phase of the vehicle, which compressed air is later used to propel the vehicle.

4,108,078
COUPLING APPARATUS ON A CIRCULATING TOW CONVEYOR

Erich Kuwertz, Trippstadt, Germany, assignor to Pfalzstahlbau GmbH, Trippstadt, Germany

Filed Mar. 2, 1977, Ser. No. 773,838
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1976, 2609371
Int. Cl.[2] B61B *10/02*
U.S. Cl. 104—172 S 1 Claim

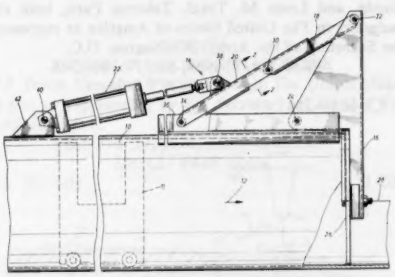


1. In a coupling apparatus for a circulating tow conveyor of the type having a tow chain and carriages which run on a track at least a portion of which is parallel to the tow chain and having coupling means between the tow chain and the carriages which coupling means comprises at least one swingable and lockable catch finger on the tow chain and a cooperative catch means on the carriages, the improvement comprising at least one housing on the tow chain, said catch finger being mounted in said housing for pivotal movement about a horizontal axis extending transversely of the feed direction and having a first contact portion extending into the path of the cooperative catch means on the carriages and a second contact portion, an arresting locking lever pivotally mounted in said housing, said locking lever having one end thereof adapted to press against said second contact portion of said catch finger to prevent pivotal movement of the lever in the direction to move the first contact portion opposite to the feed direction, a loosening lever pivotally mounted in said housing at such a distance from the catch finger as to not interfere with the pivotal movement of the latter, said loosening lever being mounted for pivotal movement in the feed direction and also opposite to the feed direction to move the locking lever out of contact with said second contact portion of the catch finger, stationary means in the path of the tow chain adapted to operate said loosening lever opposite to the feed direction to release the locking lever when the carriage is to be released from the tow chain, said loosening lever being pivoted in the feed direction by contact with the cooperative catches on said carriages to a position out of the path of movement of said cooperative catches whereby carriages can be shoved past the catch finger and the locking lever of the tow chain in the feed direction of the tow chain, said carriages being normally retained for movement by the catch finger.

4,108,079
RELEASABLE STOP FOR A VEHICLE MOVING THROUGH A CONDUIT

Marion R. Carstens, Atlanta, and Homer J. Bates, Roswell, both of Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Nov. 24, 1976, Ser. No. 744,616
Int. Cl.[2] B61B *13/10*; B65G *51/30*
U.S. Cl. 104—252 3 Claims



1. A releasable stop for releasably stopping a vehicle moving by air pressure through a conduit having an opening therein comprising,

a stop gate pivotally supported at a point outside of said conduit for movement through said opening into and out of a position transverse to the path of movement of a vehicle in the conduit,

first and second arms pivotally connected together by a first pivot connection, the first arm being pivotally connected to the gate by a second pivot connection, and the second arm being pivotally connected to a support by a third pivot connection, said first and second arms when aligned moving the stop gate to said position transverse to the movement of said vehicle and said aligned arms being positioned generally parallel to the path of movement of said vehicle for absorbing the impact of said vehicle,

an air piston and cylinder assembly connected to one of the arms for moving said arms for rotating the stop gate into and out of the path of movement of a vehicle in the conduit,

coacting stop shoulders on the first and second arms for

aligning the first pivot connection substantially in a dead center position with the second and third pivot connections when the stop gate is moved into the path of movement of a vehicle whereby the impact of a vehicle engaging the stop gate will be transmitted to the support instead of to the piston and cylinder assembly and said stop gate will be locked in the closed position, and

said stop gate is sized and shaped to entirely block the conduit to provide a dead end air cushion when moved into the path of the vehicle.

4,108,080

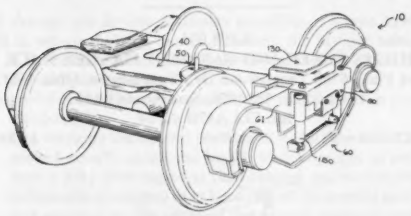
RAILWAY CAR TRUCK AND SIDE BEARING ASSEMBLY

Gerald D. Garner, Florissant; James C. Hammonds; Jan D. Holt, both of St. Charles, and Conway H. Melcher, Kirkwood, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 572,930, Apr. 29, 1975, Pat. No. 4,030,424. This application Dec. 1, 1976, Ser. No. 746,453

Int. Cl.² B61F *5/14;* **C10M** *5/00, 7/00;* **F16C** *33/24*

U.S. Cl. 105—199 CB **4 Claims**



1. In a railway car truck car body assembly including spaced side frames, each supported by the journal bearings of a pair of spaced, transversely extending wheel axles; a bolster extending transversely between said side frames; a spring assembly supported on said spaced side frames and engaging a spring receiving assembly integral with the lower surface of said bolster; said spring assembly effective to cushion said truck; said bolster having a center bearing; and a pair of side bearings mounted upon said bolster on either side of said center bearing adapted to receive the weight of the car body; a railway car body having a depending center portion engaging said center bearing; and transversely spaced depending side portions engaging said side bearings on either side of said depending center portion; the improvement comprising: each of said side bearings having an upper surface made of a first low friction material; said depending side portions each having a lower surface engaging said upper surface made of a second low friction material; one of said first and second low friction materials being at least one of nylon, polyesters, polycarbonates, polyacetals and polysulfones; and the other of said first and second low friction materials comprising polytetrafluoroethylene; whereby the weight of the car body is taken by said side bearings, and whereby the coefficient of friction between said upper and lower surfaces is sufficiently low that said truck easily rotates with respect to said car body.

4,108,081

ARRANGEMENT FOR LOCKING A FREIGHT CONTAINER TO A BASE, PARTICULARLY A TRAILER OR WHEEL FRAME

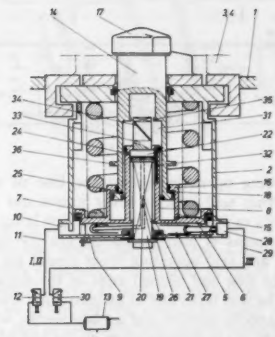
Roland Blanz, Heidelberg, Fed. Rep. of Germany, assignor to Graubremse GmbH, Heidelberg, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 718,778

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539081

Int. Cl.² B61D *17/00*

U.S. Cl. 105—366 B **16 Claims**



1. An arrangement for locking a freight container to a wheeled base comprising: brackets on said freight container; grooved curve guide means; spring-loaded clamping bolts on said base and engaging said brackets on said freight container with both form and force linkage; each of said clamping bolts having a locking head and being movable from a clamping position to a release position by a rotary lifting motion with said grooved curve guide means; a pressure-charged spring-loaded piston rotatable relative to a clamping bolt, said piston having a first hollow extension, said clamping bolt being held axially displaceable in said first hollow extension of said piston; said piston having a second hollow extension, said grooved curve guide means being located between the clamping bolt and said piston at the upper end of said second hollow extension of said piston; two opposite power sources for applying the relative motion of said clamping bolt and said piston along said grooved curve guide means; a container being horizontally slidable onto the wheeled base, said clamping bolt and said piston being axially displaceable relative to each other, said two power sources displacing said clamping bolt and said piston toward or away from each other along said grooved curve guide means.

4,108,082

CONTAINER LOCKING DEVICE

Güenther Liebscher, Wiesbaden-Kohlheck, and Güenter Christ, Geisenheim Rhg, both of Fed. Rep. of Germany, assignors to Lermer Apparatebau GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 1, 1976, Ser. No. 746,434

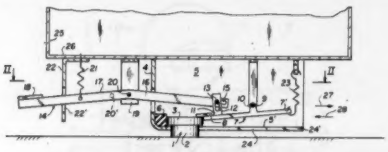
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1976, 7629359

Int. Cl.² B60P *7/08;* **B61D** *45/00;* **B64D** *9/00;* **B65J** *1/22*

U.S. Cl. 105—464 **8 Claims**

1. An apparatus for locking a transport trolley to a floor, comprising anchor means rigidly secured to said floor to define a locking position, stop means and guide means secured to the trolley engaging said anchor means when a trolley is moved against said stop means and into said locking position, a set of locking means, securing means for attaching said locking means to said trolley, said set of locking means including locking lever means, and actuating lever means, said locking lever means and said actuating lever means each having first and

second ends, said securing means including first and second journal means for respectively supporting said locking lever means and said actuating lever means, said first lever ends extending substantially toward each other, said second lever ends extending substantially in opposite directions, means operatively interconnecting said locking lever means and said actuating lever means, said first lever end of said locking lever means engaging said anchor means in a locking manner in said locking position, and spring means biasing said actuating lever means and said locking lever means in a locking direction to engage said anchor means, said second end of said actuating



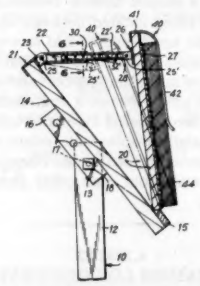
lever means being operable against the bias of said spring means for shifting said locking lever means out of locking engagement with said anchor means, the first lever end of the locking lever means is also biased by gravity toward said anchor means, and said actuating lever means are journalled intermediate the first and second ends of the actuating lever means so that the first lever end of the actuating lever means is also biased by gravity toward said anchor means, whereby the combined weight of the locking lever means and of the actuating lever means tend to maintain the locking lever means in the locking position.

4,108,083

PORTABLE WRITING AND READING TABLE ASSEMBLY

Albert Espinosa, 838 Riverside Dr., New York, N.Y. 10032

Filed May 4, 1977, Ser. No. 793,810
Int. Cl.[2] A47F *5/12*
U.S. Cl. 108—6 **2 Claims**



1. A portable writing and reading table assembly comprising:

a pair of spaced-apart stands, each including a generally flat base and an upstanding post secured to said base, said posts of each of said stands each having a plurality of transversely-extending, vertically spaced-apart holes formed therethrough adjacent the top end thereof;

a generally flat rectangular writing board, having an elongated holding bar mounted across the lower end thereof, and extending outwardly from the front face thereof, said board also having a flange having a plurality of spaced-apart holes formed therethrough, which depends from each of the lateral edges thereof and which are alignable with the holes of said posts;

means for rotatably mounting said board between and on said posts of said stands, to permit rotational movement of said board about an axis perpendicular to the longitudinal axes of said posts and for locking said writing board at a desired angle of inclination relative to said axes of said posts, said mounting and locking means comprising at least one bolt having an enlarged bolt head at one end, and a threaded portion at its other end which is receivable within the aligned holes of said posts and flanges, and at least one wing nut threadable receivable on said threaded portion of said bolt, for locking said board at a desired angle of inclination, said plurality of holes in said posts and flanges permitting adjustment of the height of said writing board; and

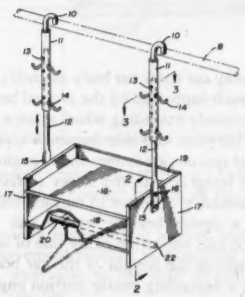
a generally flat reading board, having a lower end which rests upon said holding bar, and means for removably and adjustably mounting said reading board on said writing board, so as to permit pivotal movement of said reading board about its lower end and so as to permit adjustment of the angle of inclination of said reading board relative to the plane of said writing board, said adjustable mounting means including a generally U-shaped bracket frictionally and removably mountable on said writing board on a generally T-shaped bracket secured to the rear face of said reading board and a pair of elongated, hollow, tubular members, one of which is pivotably coupled to said U-shaped bracket on said writing board and the other of which is pivotably coupled to said T-shaped bracket, each of said members having at least one hole formed therethrough, and one of said members being receivable within the other member so as to permit alignment of said hole of said one member with that of said other member, said mounting means also including a pin, one end of which has an enlarged head portion and the other end of which is insertable within the pair of opposing, aligned holes of said members for securing said members together, and for fixing said reading board at a desired angle of inclination relative to the plane of said writing board.

4,108,084

CHILD'S SHELF AND GARMENT HANGER RACK

Robert Fink, 6780 Tanglewood Dr., Youngstown, Ohio 44512

Filed Feb. 25, 1976, Ser. No. 661,345
Int. Cl.[2] A47B *41/04*
U.S. Cl. 108—29 **1 Claim**



1. In a child's shelf and garment hanger rack the combination of a pair of vertically spaced horizontally disposed shelves and end members positioned on and secured to the opposite ends of said shelves and extending below and above said shelves, a bar positioned between and supported on said end members below said shelves in spaced parallel relation to said shelves and upstanding longitudinally adjustable support members on said end members midway between the front and back edges thereof, garment hanging members carried by said support member and means for suspending said support members and said shelves from a clothes hanger bar in a clothes closet, said means comprising hook configurations on the upper ends of said adjustable support members said end members take the

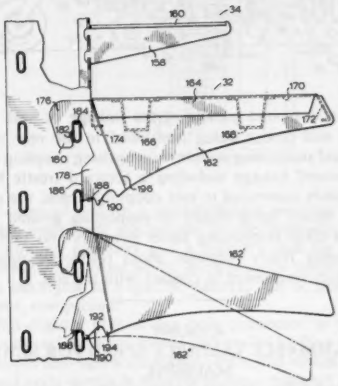
form of side panels and a back panel is secured to said side panels and to one edge of each of said shelves and wherein the back panel extends above said shelves to register with said end members.

4,108,085

DISPLAY STRUCTURE

Charles Grey Shepherd, Oakville, and Brian Donald Yeoman, Milton, both of Canada, assignors to J.A. Wilson Display Limited, Mississauga, Canada

Filed Mar. 14, 1977, Ser. No. 777,187
Claims priority, application Canada, Nov. 16, 1976, 265817
Int. Cl.[2] A47B *9/00, 3/00, 57/20*
U.S. Cl. 108—108 **8 Claims**



1. An upright for use in display gondolas of a type having a wall to which shelving can be attached, the upright being for use in the construction of the wall for attachment of the shelving and comprising:

a pair of central portions spaced from one another in parallel relationship;

means bridging the central portions at a plurality of locations spaced equally along the length of the upright to receive heavy duty shelf supports the bridging means comprising deformations created in at least one of the central portions and attached to the other of the central portions; and

a pair of flanges lying in a common plane perpendicular to the central portions and respectively dependent one from each of the central portions in directions away from one another, each of the flanges defining openings spaced along the length of the flanges to receive light duty shelf supports and the thickness of the material of the flanges being less about said openings than the thickness of the central portions and less than the thickness of the remainder of the flanges.

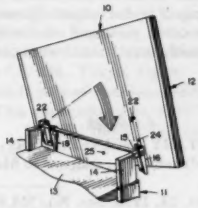
4,108,086

DRAFTING BOARD AND SUPPORT STRUCTURE THEREFOR

Leonard J. Yindra; David F. Evans, and Joseph R. Klug, all of Manitowoc, Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 21, 1975, Ser. No. 624,415
Int. Cl.[2] A47B *3/06*
U.S. Cl. 108—157 **23 Claims**

1. A tiltable table top and base assembly comprising a base adapted to rest upon a floor surface and having bracket means mounted for pivotal movement about a horizontal pivot axis, a table top detachably secured to said bracket means for pivotal movement therewith from a substantially vertically disposed position to a substantially horizontally disposed position, one of said table top and bracket means, when in the vertically disposed position, having a pair of generally horizontal bearing surface portions and the other of said table top and bracket means having a pair of laterally-spaced connectors independently and slidably engagable with said surface portions, said bearing surface portions being laterally spaced and horizontally aligned relative to each other, said bearing surface portions and said connectors engaging each other at locations intermediate the upper and lower limits of said table top and along the backside thereof when said table top is in its verti-



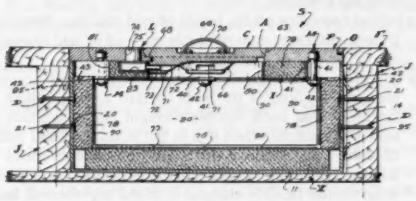
cally disposed position, whereby, in assembling said table top and said base, one end of said table top when in the substantially vertically disposed position may be lifted and supported by first positioning one of said connectors in sliding engagement with one of said bearing surface portions, and thereafter, the opposite end of said table top may be lifted and supported by positioning the other of said connectors in engagement with another of said bearing surface portions, and means anchoring said table top to said bracket means against independent relative movement.

4,108,087

FLOOR SAFE

Walter C. Sebesta, 8651 Foothill Blvd., Cucamonga, Calif. 91730

Filed Nov. 30, 1977, Ser. No. 855,972
Int. Cl.[2] E05G *1/024*
U.S. Cl. 109—51 **10 Claims**



1. In combination, a wood floor structure including at least two elongate laterally spaced and parallel floor joists with flat, vertical opposing sides, and a flat horizontal floor in overlying fixed supported engagement with the joists and having a vertical rectangular opening between the joists, a floor safe including a rectangular upwardly opening box-like metal body with a flat horizontal bottom wall and flat vertical side walls with upper edges defining an upwardly disposed rim about the open top of the body, said body corresponding generally in plan configuration with the opening in the floor and slidably engageable therethrough; said body is arranged between the joists with opposite side walls in substantial flat bearing engagement with said opposing sides of the joists, in alignment with the opening in the floor and with said rims spaced a predetermined distance below the top surface of the floor, fastening means securing the body to the joists and including apertures in said opposite side walls and elongate fasteners engaged through the apertures and into the joists from within the body and through the open top thereof, a flat horizontal cover plate corresponding in plan configuration with the body

arranged in the opening in the floor and in overlying relationship with the body with its bottom surface engaged with said rim; said cover plate has a central vertical access opening, coupling means releasably securing the cover plate in tight clamped engagement with the body and comprising laterally inwardly projecting brackets on the side walls, vertical threaded studs on the cover plate depending through the brackets and nuts engaged on said studs and advanced upwardly into tight engagement with said brackets, said brackets, studs and nuts being engageable from above the floor through the access opening and at the interior of the body, a closure plate releasably engaged in the access opening and locking means carried by the cover plate and releasably engaging the closure plate to releasably secure the closure plate in the access opening.

4,108,088

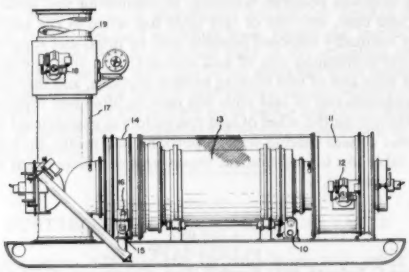
ROTARY INCINERATOR

Roy B. Burden, Jr., Makaha, Hi., assignor to Met-Pro Systems, Inc., Lansdale, Pa.

Filed Nov. 24, 1976, Ser. No. 744,591

Int. Cl.[2] F23G *5/06*

U.S. Cl. 110—246 **10 Claims**



1. Material treatment apparatus comprising:

a substantially horizontal rotating heated chamber, wet material to be dried being supplied to one end of said rotating chamber,

a helical conveyor on the inside of said rotating chamber for transporting said material from one end of said chamber to the other end of said chamber,

a plurality of elongated flexible metallic heat scavening elements secured at the ends thereof to said helical conveyor so that each flexible element lies in contact with said wet material when it is in the bottom of said rotating chamber, and wherein said flexible elements move to a hanging position as said chamber rotates to a position wherein the flexible element is at the top thereof, and

a primary burner fired by auxiliary fuel at said one end, gases from said primary burner blowing through the length of said drum and into contact with said flexible elements when they are disposed in a hanging position, the wet material clinging to said flexible elements having the moisture therein volatized by said gases, the remaining dry material being transported to the other end of said rotating chamber by said helical conveyor.

4,108,089

AGRICULTURAL IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

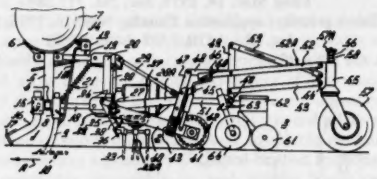
Filed Aug. 23, 1976, Ser. No. 716,570

Claims priority, application Netherlands, Aug. 22, 1975, 7509938

Int. Cl.[2] A01C *23/02*

U.S. Cl. 111—7 **16 Claims**

1. An agricultural implement comprising frame means and a plurality of tined cultivating members mounted on an elongated portion of said frame, said members having respective upwardly extending shafts and being rotatable about corresponding axes defined by said shafts, driving means connected to said members and rotating said members to work the soil, the front of said frame means including a supporting structure that is linked to said frame portion by a first parallelogram linkage being positioned in front of said members and soil penetrating tools mounted on said supporting structure, said tools having fluid distribution means in communication with a fluid container of said implement to distribute fluid in advance of said cultivating members, at least one seeding device being



mounted on a second parallelogram linkage of said frame means and said device being positioned to the rear of said members, said supporting structure comprising coupling means and said second linkage including a forward trestle having coupling points connected to said coupling means, the rear of said frame means being linked to supporting ground wheel means, said tools comprising tined members and said tined members being freely rotatable about respective upwardly extending axes responsive to contact with the soil.

4,108,090

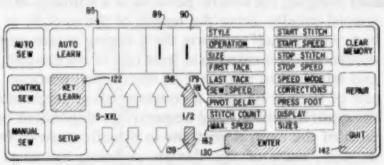
PROGRAMMABLE VARIABLE SPEED FOR SEWING MACHINE

John Vernon Landau, Jr., Mt. Lakes, and Frederick Alexander Rupinski, Lyndhurst, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,887

Int. Cl.[2] D05B *19/00*

U.S. Cl. 112—121.11 **22 Claims**



1. A programmable sewing machine adapted to perform a series of sequential operations on a work material, said programmable sewing machine comprising:

a sewing machine frame;

a sewing needle supported by said frame for selectively repeated movement from a down position through a work material to an up position and return to a down position;

a looptaker supported by said frame for cooperation with said sewing needle in the formation of stitches;

a reversible work material feed system supported by said frame and including feeding means for passing work material in a path between said needle and said looptaker;

a single continuously variable speed drive means for selectively actuating said sewing needle, said looptaker and said work material feed system in stitch forming synchronism with each other to provide variable speed sewing;

manual treadle means for continuously variable speed actuation of said variable speed drive means; and

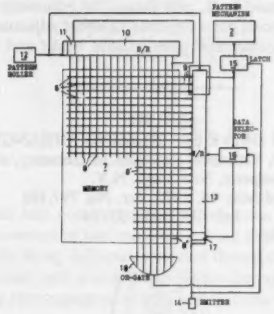
means for recording a speed profile of said variable sewing speed as generated by manual actuation of said manual treadle means.

4,108,091

ELECTRONIC CIRCUITS FOR SEWING MACHINES

Per-Goran Hedstrom, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden

Filed Mar. 23, 1976, Ser. No. 669,629
Claims priority, application Sweden, Jun. 18, 1975, 7506986
Int. Cl.[2] D05B 3/02
U.S. Cl. 112—158 E 15 Claims



1. A control unit for a pattern sewing machine including a movable main shaft mechanism for mechanically positioning stitch-forming members and a memory unit for controlling such mechanism, from which stitch position determining code words belonging to a specific pattern, can be selected by an operator, comprising:

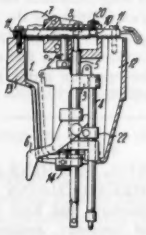
a shift register (13) having cells connected to output lines from said memory; means for parallel loading of said code words into said shift register cells; and means for shifting said code words in relation to the movement of the main shaft of the sewing machine so that for each stitch in said pattern, code words belonging thereto are output to said positioning mechanism from said shift register.

4,108,092

ZIG-ZAG SEWING MACHINE

Marcel Fresard, Petit-Lancy, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Dec. 13, 1976, Ser. No. 750,123
Claims priority, application Switzerland, Dec. 18, 1975, 16449/75
Int. Cl.[2] D05B 3/02
U.S. Cl. 112—158 R 3 Claims



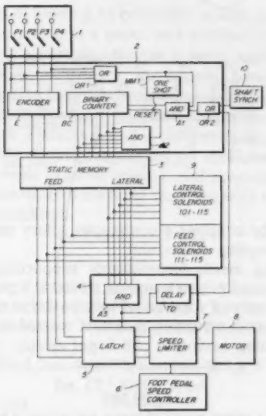
1. In a zig-zag sewing machine including, an upper arm having a head at its free end, a principal driving shaft disposed in said upper arm having a free end in said head, a plate disposed in said head transversely to said upper arm, a cradle having a shaft connected to said plate, a needle bar slidably mounted in said cradle, the improvement comprising, a cylindrical bar mounted transversely in said head at right angles to said principal shaft, said plate pivotally suspended by its upper edge from said cylindrical bar, a member fixedly attached to said needle bar and having a bore, a crank connecting rod having a gudgeon engageable within said member bore, and securing means cooperating with and disposed adjacent the lower portion of said plate and adjustably securable to said head to maintain alignment between said member bore and gudgeon by manipulation of said securing means to alter the disposition of said plate about said cylindrical bar.

4,108,093

PATTERN STITCHING SPEED CONTROL SYSTEM FOR ELECTRONIC SEWING MACHINES

Kazuo Watanabe, Hachioji; Tosiaki Kume, Tachikawa; Hideaki Takenoya, Hachioji; Toshihide Kakinuma, Tokyo, and Hachiro Makabe, Fussa, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 737,084, Oct. 29, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,416
Int. Cl.[2] D05B 3/02, 69/18
U.S. Cl. 112—158 E 11 Claims



1. In a sewing machine, in combination, a sewing needle mounted for reciprocatory penetration into work being sewn and also mounted for lateral shifting movement; a drive motor reciprocating the needle; motor-control means for controlling the operation of the drive motor; lateral-control means for controlling the lateral shifting movement of the needle; work-feeding means for feeding work to the sewing needle; feed-control means for controlling the operation of the work-feeding means; a static memory storing pattern information representing the stitches in a plurality of different multi-stitch stitching patterns and also motor-speed-control information for the different stitching patterns; pattern selecting means for selecting the stitching pattern to be sewn; information-transmitting means responsive to the pattern selection for transmitting from the static memory to the lateral-control means and the feed-conrol means the pattern information associated with the selected pattern and for transmitting from the static memory to the motor-control means the motor-speed-control information associated with the selected pattern.

4,108,094

RUFFLING ATTACHMENT

Karl Weigert, Englishtown, N.J., assignor to Reliable Attachment Company, New York, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,128
Int. Cl.[2] D05B 35/08
U.S. Cl. 112—134 12 Claims

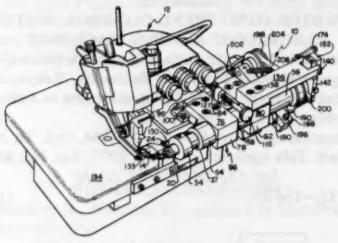
1. A sewing machine attachment, comprising:

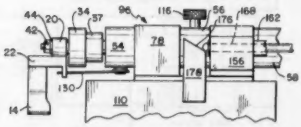
(a) finger means positioned, configured and dimensioned to grip a fabric disposed on the work table of a sewing ma-

chine when said finger means is advanced toward the needle of said machine;

(b) support means adapted to be secured to said sewing machine;

(c) power coupling means rotatably mounted on said support means;





(d) means for coupling a continuous rotary motion to said power coupling means; and

(e) mounting means for rotatably supporting said finger means on said power coupling means at a point removed from the axis of rotation of said power coupling means whereby said mounting means is rotated and imparts a reciprocating motion to said finger means.

4,108,095

ROTARY LOOP TAKER FOR SEWING MACHINE

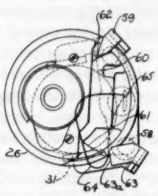
Tadao Kohara, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed Dec. 1, 1976, Ser. No. 746,410

Claims priority, application Japan, Dec. 20, 1975, 50-172346[U]; Dec. 26, 1975, 50-180359[U]

Int. Cl.[2] D05B *57/14*

U.S. Cl. 112—184 **2 Claims**



1. In a sewing machine, a loop taker mechanism comprising a vertical shaft, a rotatable casing having a hook formed on an edge of the casing wall and rotatable on said shaft, a cam secured to the underside of said casing, a bobbin carrier rotatably supported in said casing, said carrier having on its upper surface a pair of spaced abutment faces, an adjustable escapement yoke mounted for oscillation about an axis parallel to said shaft, said yoke comprising first and second parts, the first part having a horizontal member including a forked portion embracing said cam and having an upstanding arm terminating in a first horizontal beak, said second part having a horizontal member superimposed on said first mentioned horizontal member and having an upstanding arm terminating in a second horizontal beak, each of said beaks cooperating with a respective abutment face in such a manner that one of said beaks always is in engagement with one of said abutment faces so as to prevent rotation of said bobbin carrier, the oscillation of said escapement yoke effecting alternate spacing between each pair of beaks and abutment faces for the passage of an upper thread loop, a guide plate overhanging one of said beaks, the leading edge of said guide plate serving to retain the thread loop released from said hook so as to prevent the thread loop from moving behind said beak, and means for adjustably securing said first and second parts together to effect adjustment in the engagement of respective pairs of said beaks and abutment faces.

4,108,096

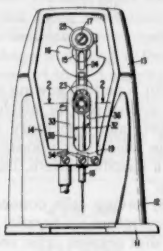
NEEDLE BAR DRIVE STABILIZING ARRANGEMENT

Heinrich Ciecior, Ettlingen, Fed. Rep. of Germany, assignor to The Singer Company, New York, N.Y.

Filed May 16, 1977, Ser. No. 797,101

Int. Cl.[2] D05B *55/14*

U.S. Cl. 112—221 **1 Claim**



1. A needle bar drive stabilizing arrangement for the needle bar reciprocating mechanism of a sewing machine having a frame, a drive shaft journalled in said frame and carrying a crank pin, a needle carrying bar endwise reciprocally mounted in bearings in the frame and having a lateral drive stud secured thereon, and a connecting link having at one extremity a hub embracing the crank pin and at the other extremity a hub embracing the drive stud which is secured on the needle bar, and a guide member fastened to the machine frame and formed with a guide slot having sidewalls parallel to the needle carrying bar one at each side of the drive stud, characterized by this that a cylindrical antifriction bearing is provided of which the inner bearing race is fitted on the drive stud and the outer bearing race is arranged with clearance between the guide slot sidewalls so that during each stroke of the needle bar the outer bearing race will be urged into rolling contact with one guide slot sidewall during acceleration of the needle bar and into rolling contact with the opposite guide slot sidewall during deceleration of the needle bar.

4,108,097

DEVICE ON A SEWING MACHINE FOR SEVERING THREAD CHAINS

Helmut Gross, Kaiserslautern, and Kurt Klundt, Hirschhorn, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen G.m.b.H., Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,162

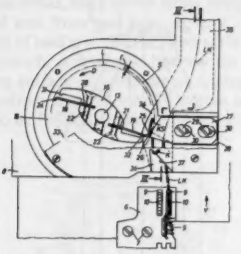
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640557

Int. Cl.[2] D05B *65/06*

U.S. Cl. 112—287 **8 Claims**

1. A device on a sewing machine for severing a thread chain, comprising a driven movable cutting knife having a cutting edge, a stationary counterknife disposed alongside said driven cutting knife, means for driving said cutting knife through a path to move it alongside said fixed counterknife with its cut-

ting edge spaced slightly away from said fixed counterknife as it moves past said fixed counterknife, elastic means mounting said driven cutting knife for elastic deflection and displacement, means for directing a thread chain so that it is selectively



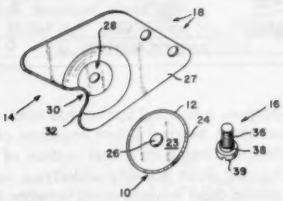
moved over said counterknife to a deflection position in the path of movement of said movable cutting knife, said movable cutting knife being deflectable by said thread chain to move it to a movement path which brings it into the range of cooperative cutting interengagement with said stationary counterknife.

4,108,098

THREAD CUTTER

John H. Keeton, P.O. Box 278, Taylor Blvd., Campbellsville, Ky. 42718

Filed Dec. 20, 1976, Ser. No. 752,302
Int. Cl.[2] D05B 65/00
U.S. Cl. 112—289 **6 Claims**



1. A thread-cutting assembly for use with a sewing machine comprising

a circular metal cutting disk having a circumferential cutting edge;

guard means for preventing access to the majority of the circumferential cutting edge of said disk but exposing a portion of the disk circumferential cutting edge, the guard means being metal having a greater temper than the metal of the disk so that said guard means sharpens said disk cutting edge upon relative rotative engagement movement therebetween;

means for mounting said disk to said guard means so that said disk rotates with respect to said guard means about an axis when thread to be cut by said disk is brought into engagement with the exposed portion thereof so that a new cutting surface is exposed; and

means for operatively mounting said guard means to a sewing machine.

4,108,099

METHOD AND APPARATUS FOR FORMING A COATED CONTAINER

Fred Fidler, Cuffley, and Joseph C. Holt, Greenford, both of England, assignors to Metal Box Limited, England

Filed Oct. 18, 1976, Ser. No. 733,275
Int. Cl.[2] B21D 51/26
U.S. Cl. 113—120 A **20 Claims**

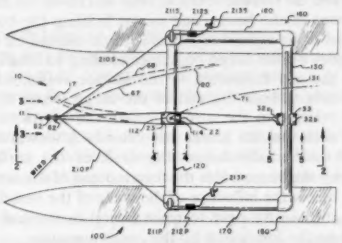
1. A method of forming an externally coated container body from a starting article in a press, said method comprising the steps of placing a starting article in a press, applying a water reducible coating material to the starting article while the starting article is in the press, then actuating the press to press the starting article into the container body utilizing the coating material as both a lubricant and a coolant during the pressing with the coating material remaining on the formed container body as an overall external coating, and removing the externally coated container body from the press with the coating in a hardenable condition.

4,108,100

RIGGING BASE FOR PLURAL-HULL SAILING CRAFT AND METHODS FOR SAIL CONTROL

Robert Stuart Jamieson, 3705 Stephen M. White Dr., San Pedro, Calif. 90731

Filed Jun. 9, 1977, Ser. No. 804,875
Int. Cl.[2] B63H 9/04
U.S. Cl. 114—102 **14 Claims**



1. An improved rigging-base system for a plural-hull sailing craft, comprising:

(a) elongated spar means adapted for attachment of rigging, and further adapted for being mounted longitudinally on a plural-hull sailing craft with at least one arm of said spar means projecting outward beyond any structure of said craft upon which said spar means is mounted,

said arm being capable of substantial controllable lateral deflection at its outer end,

(b) attaching means, whereby standing and running rigging may be attached to said spar means,

(c) a plurality of mounting means for mounting said spar means on said plural-hull sailing craft,

first said mounting means being adapted for mechanically connecting said spar means to first hull-interconnecting structure of said sailing craft, second said mounting means being adapted for mechanically connecting said

spar means to second hull-interconnecting structure of said sailing craft,

(d) mast step means for mounting the foot of the mast of said sailing craft whereby downthrust forces exerted by said mast may be transmitted to said spar means,

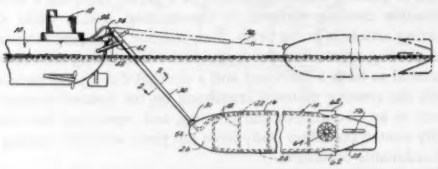
whereby reaction forces exerted by said spar means responsive to upward components of tension in said rigging attached to said spar means will oppose a substantial portion of said downthrust forces, thereby reducing the forces to be resisted by said hull-interconnecting structures and hulls of said sailing craft, and further whereby the weight of said hulls and said hull-interconnecting structures may be reduced.

4,108,101

TOWING SYSTEM FOR CARGO CONTAINERS

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Dec. 6, 1976, Ser. No. 747,630
Int. Cl.[2] B63B *21/56*
U.S. Cl. 114—245 **9 Claims**



1. Apparatus for transporting cargo in a body of water comprising a self-propelled surface vessel, a submergible elongated cargo container, a boom including a semi-rigid continuous structure capable of transferring lateral forces producing a moment about one end of the boom to the other end of the boom, means coupling one end of the boom to the stern of the surface vessel, and means coupling the other end of the boom to the forward end of the cargo container, the means coupling the boom to the surface vessel including drive means for adjusting the angle in a vertical plane between the axis of the boom and the surface vessel to raise and lower the cargo vessel by means of the boom, and means holding the boom at any selected angle against any lateral force exerted on one end of the boom by the cargo container tending to rotate the boom about the end connected to the surface vessel, whereby the boom acts to hold the end of the cargo vessel at a selected depth relative to the surface vessel, the length of the boom being such that the lower end extends downwardly into the water substantially below the draft of the surface vessel, whereby the boom holds the forward end of the container at a depth below the influence of the wake of the vessel, the boom being sufficiently rigid to resist lateral or vertical forces imposed on the lower end by the cargo container.

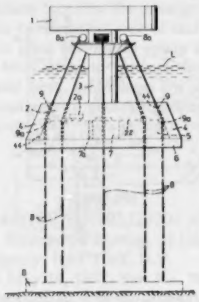
4,108,102

ANCHORABLE, FLOATING PLATFORM

Karl Olof Lindström, Karlskrona, Sweden, assignor to Karlskronavarvet AB, Karlskrona, Sweden

Filed Dec. 15, 1976, Ser. No. 754,267
Claims priority, application Sweden, Dec. 19, 1975, 7514420; Nov. 9, 1976, 7612441
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—264 **9 Claims**

1. Anchorable, floating platform for extraction of oil and gas from the bottom of the sea, comprising an upper portion which is over the water surface; a lower portion which is at least to the greater part submerged into the water surface; a closed column connecting the upper portion with the lower portion and allowing internal transportation of persons between the two portions; a ring of ballast tanks provided on the lower portion; means to stabilize the platform wherein said ring of ballast tanks extends below the bottom of the lower portion, so that a bowl-shaped space open at the bottom is formed by the ballast tanks and the bottom of the lower portion; means for



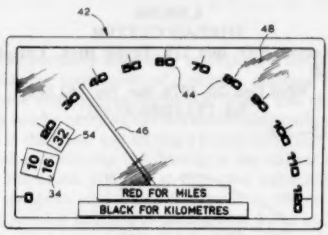
blowing pressurized air at superatmospheric pressure into the bowl-shaped space under the bottom of the lower portion for forming an air cushion under the lower portion; and anchor wires passing the ring of ballast tanks.

4,108,103

UNIT CONVERSION LABEL

Felix Ammar, 130 Sylvan Ave., Scarborough, Ontario, Canada

Filed Jul. 11, 1977, Ser. No. 814,739
Int. Cl.[2] G01P *1/08*
U.S. Cl. 116—116 **13 Claims**



1. A multi-purpose numerical conversion label which comprises; a planar sheet bearing a first sequence of numerical indicia, an adhesive coating on a rear surface of said planar sheet, and a backing sheet peelably underlying said adhesive coating, said planar sheet being severed between each pair of indicia of said first sequence of indicia to permit ready peeling from said backing sheet of a plurality of portions of said planar sheet, each such portion bearing a single indicium of said first sequence, a second sequence of numerical indicia being provided on said label with the indicia of said second sequence in alignment with respective ones of the indicia of said first sequence and each having a predetermined constant mathematical relationship with the aligned indicium of said first sequence and each indicium of said first and second sequences being visible on observation of said front surface of said planar sheet.

4,108,104

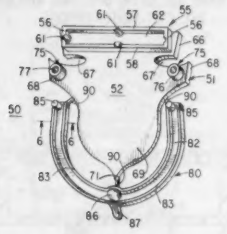
ONE PIECE PLASTIC MOLDED STRUCTURAL UNIT AND DOOR KNOCKER CONSTRUCTED THEREFROM

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Filed Jun. 29, 1977, Ser. No. 811,168
Int. Cl.[2] G01K *1/26*; B28B *21/00*
U.S. Cl. 116—148 **14 Claims**

1. An integrally connected one piece molded synthetic or-

ganic resin structure, for easy assembly into a door knocker capable of producing a predetermined audible sound, comprising a synthetic organic resin base having at least a portion of the rear surface thereof flat, a synthetic organic resin arm connected to said base at spaced apart points by at least two relatively thin struts, each of the struts being easily severed to separate said arm from said base, at least one boss receiving means on one of said arm and the front surface of said base and integral therewith, at least one boss on the other of said arm and the front surface of said base and integral therewith extending therefrom sized to snap fit within said boss receiving means and to be frictionally engaged and maintained thereby,



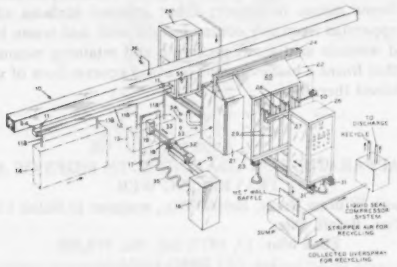
said arm having a size such that when said boss and said boss receiving means are frictionally engaged said arm has a free end thereof overlying a portion of said base which is normally urged toward said base, said arm being flexible to permit the free end thereof when said boss is frictionally engaged and maintained by said boss receiving means to be bent away from said base without breaking said arm, said boss and boss receiving means cooperating with said arm thus mounted on said base to cause said arm to snap back toward and against said base upon release of said arm from the bent away position thereof, thereby striking said base with a predetermined force to make an audible sound.

4,108,105

PART GAGING CONTROL FOR LIQUID SPRAY SYSTEM

Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn.

Filed Apr. 2, 1976, Ser. No. 672,848
Int. Cl.[2] B05C *5/00, 15/00*
U.S. Cl. 118—2 **28 Claims**



1. In a paint spray system, an apparatus for gaging the width of a workpiece to be painted, which comprises

(a) means for conveying workpieces through said paint spray system,

(b) a plate-like element positioned adjacent said conveying means and displaceable to contact a workpiece on said conveying means,

(c) a plurality of normally-opened switching means, each being mechanically linked to said plate-like element whereby the displacement of plate-like element sequentially closes said switching means, one at a time, whereby each of said switching means corresponds to a predetermined forward position range of said plate-like element, when in a closed condition,

(d) a plurality of storage means, each being assigned to one of said predetermined forward position ranges of said plate-like element,

(e) a voltage supply means,

(f) electrical control means interconnecting said voltage supply means with each of said storage means through the switching means corresponding to the predetermined forward position range assigned to said storage means, and

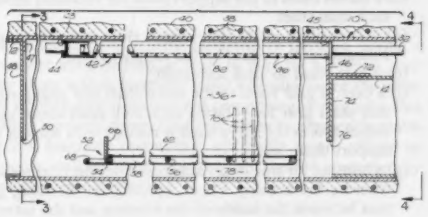
(g) said electrical control means being operative upon contact between the plate-like element and the workpiece to apply the electrical energy of said voltage supply means to the storage means corresponding to the forward position range occupied by the plate-like element at said contact through the switching means operated in said occupied forward position range.

4,108,106

CROSS-FLOW REACTOR

Alfred R. Dozier, Huntington Beach, Calif., assignor to Tylan Corporation, Torrance, Calif.

Filed Dec. 29, 1975, Ser. No. 644,997
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—49 **15 Claims**



1. A cross-flow reactor for processing of a plurality of at least three units of semiconductor material, each unit being formed of a wafer having a substantially planar surface, comprising:

means for defining an elongate chamber into which can be inserted said plurality of units of semiconductor material which are to be contacted with process gas;

carrier means for disposing said units with their planar surfaces vertically directed;

means for heating said chamber along a substantial length thereof to a desired temperature sufficient for desired reaction of said process gas with said semiconductor material;

means for distributing process gas to a plurality of at least three discrete locations within said chamber spaced from each other and spaced inwardly from the ends of said chamber length for travel of said gas across the longitudinal axis of said chamber as gas flows along a plurality of spaced paths for single pass traversal thereof; and

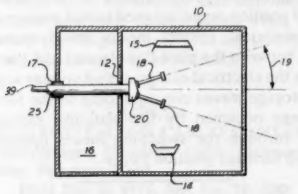
means for exhausting said gas flows from said chamber after said single pass;

said distributing means comprising at least one elongate manifold tube, for receiving said process gas, disposed longitudinally within said chamber along said heated chamber length and formed with an opening at each said location for cross-flow therefrom of said process gas, said manifold tube being formed with a closed end downstream of said heated chamber length and wherein said distribution means includes at least one imperforate conduit tube within and extending along said manifold tube for delivering said process gas along said heated chamber length for counterflow of said process gas in said manifold tube from said closed end to said locations.

4,108,107
ROTATABLE SUBSTRATE HOLDER FOR USE IN VACUUM

Glen R. Scheuermann, Oakland, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed Apr. 1, 1976, Ser. No. 672,691
Int. Cl.[2] C23C *13/02*
U.S. Cl. 118—49.1 11 Claims

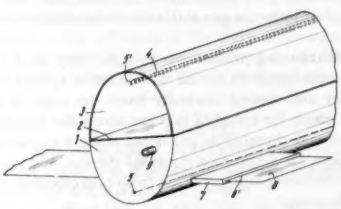


1. A holder for supporting and rotating at least two substrates in the vicinity of a coating source inside a vacuum chamber, comprising:
(a) a hollow support shaft for supporting the substrates for rotation about a main axis;
(b) a stub shaft for supporting each substrate for rotation about an individual axis;
(c) a means fixed to the support shaft for rotatably mounting each stub shaft;
(d) a drive shaft inside the support shaft and independently rotatable with respect to the support shaft;
(e) a gear fixed to each stub shaft;
(f) a central gear fixed to the drive shaft and engaging each stub shaft gear for rotating each stub shaft about its individual axis as the drive shaft is rotated with respect to the support shaft; and
(g) a housing for shielding each gear from the coating source wherein the housing has an opening for allowing gas to pass between the inside of the housing and the interior of the support shaft.

4,108,108
APPARATUS FOR METALLIZING STRIPS, SHEETS OR THE LIKE

Hermann Johannes Schladitz, Munich, Fed. Rep. of Germany, assignor to Schladitz-Whiskers AG., Zug, Switzerland

Continuation of Ser. No. 486,956, Jul. 10, 1974, abandoned. This application May 21, 1976, Ser. No. 688,560
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—49.1 6 Claims

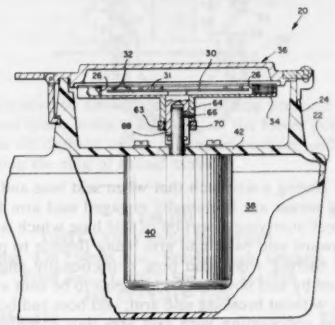


1. An apparatus for metallizing sheet material by thermal decomposition of a gaseous metallic compound comprising:
a metallizing chamber,
inlet means coupled to said chamber for permitting said gaseous metallic compound to be supplied to said chamber;
means coupled to said chamber for enabling said sheet material to be continuously passed through said chamber while maintaining a gaseous atmosphere of said metallic compound adjacent said sheet material inside said chamber; and
optical means about said metallizing chamber for generating a narrow, elongated high temperature zone adjacent one surface of said material, said high temperature being sufficient to cause thermal decomposition of said compound and metallization of said material, and said zone being sufficiently localized to confine heating of said material to said one surface.

4,108,109
BLOOD FILMING APPARATUS

J. P. Barger, Winchester, and Joseph A. Holroyd, Nahnasset, both of Mass., assignors to Dynatech Corporation, Burlington, Mass.

Filed May 13, 1974, Ser. No. 469,099
Int. Cl.[2] B05C *13/02*
U.S. Cl. 118—52 17 Claims



1. In a centrifuge apparatus, comprising a sample support member, adapted to receive a liquid sample on a sample-receiving surface and to achieve the distribution of said liquid sample as a film over said sample-receiving surface, as said sample-receiving surface is rotated in the plane of said surface the improvement wherein said apparatus comprises waste-receiving and retaining means positioned about the periphery of a sample support member and adapted to receive and hold excess liquid from a plurality of said liquid samples spun off the sample-receiving surface as it rotates, and means to rotate said waste receiving means and said sample support member at substantially the same rpm;
and wherein said waste-receiving and retaining means also forms means to protect other internal surfaces of the apparatus from any contamination with said waste blood
and wherein said waste-receiving and retaining means further forms a barrier means to avoid reverse flow of waste blood therefrom.

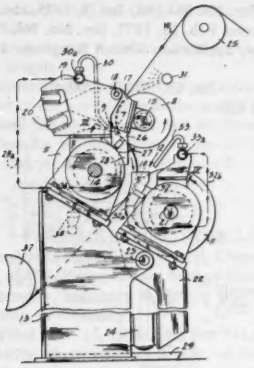
4,108,110
APPARATUS FOR COATING BOTH SIDES OF A TRAVELLING WEB

Kenneth William Berry, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 17, 1977, Ser. No. 778,506
Int. Cl.[2] B05C *3/132*
U.S. Cl. 118—412 20 Claims

1. Apparatus for puddle coating both sides of a travelling web, comprising:
first and second horizontal rolls providing a first nip and defining a first generally upwardly directed puddle trough over said first nip;
a third horizontal roll forming a second nip with said second roll below said first nip and defining a second puddle trough opening generally upwardly for coating material;
means for supplying said puddle troughs with respective puddles of coating material;
whereby one side of a web is adapted to be coated by running it through the first puddle trough and nip while its

opposite side is in running engagement with the first roll and thereby protected from the coating material in the first puddle trough and continuously thereafter said opposite side is adapted to be coated by running the web through the second puddle trough and the second nip



while said first side is in running engagement with said second roll and thereby protected from the coating material in the second puddle trough;

and means for preventing migration to said second trough of coating material which may be carried from said first trough on the ends of said second roll.

4,108,111

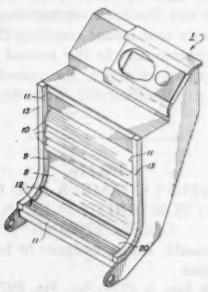
DEVELOPER HOUSING

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1977, Ser. No. 802,157

Int. Cl.[2] G03G *15/08*

U.S. Cl. 118—655 **4 Claims**



1. A tank developing system for developing latent magnetic images on magnetizable imaging members with magnetic toner, comprising: a developer housing having formed therein a chamber for the storage of magnetic toner, a wall member of said housing extending below said chamber; an opening in said housing in communication with said chamber; the wall member below said chamber being shaped to conform to a predetermined path of travel of a magnetizable imaging member; means for selectively varying the size of said opening; baffle means for removing airborne toner from the vicinity of the magnetizable imaging member and located above said opening; and resilient seal forming means affixed to said one wall on the side thereof opposite said chamber and adapted to contain toner between said one wall, said resilient seal forming means and said magnetizable imaging member along said predetermined path of travel.

4,108,112

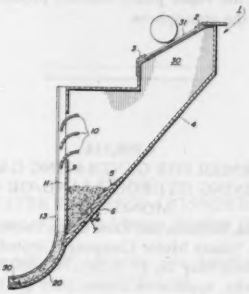
DEVELOPER HOUSING

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1977, Ser. No. 802,162

Int. Cl.[2] G03G *15/08*

U.S. Cl. 118—655 **5 Claims**



1. In magnetic development apparatus of the type having a development zone defined at least in part by a sloping wall member along which magnetic toner migrates under the influence of gravity, the improvement comprising: a magnetic flux channeling member comprising magnetically permeable material of low magnetic retentivity; and baffle means affixed to said sloping wall member upon the side thereof contacted by toner during development.

4,108,113

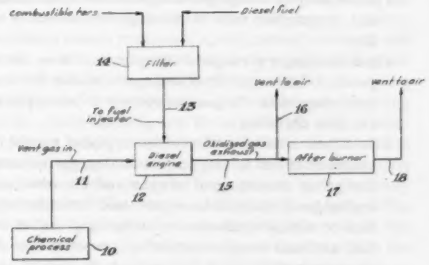
METHOD FOR REDUCING CONCENTRATION OF HARMFUL OR OFFENSIVE VAPORS IN THE ATMOSPHERE

Edward E. Timm, Beaverton, and Donald I. Townsend, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1976, Ser. No. 684,595

Int. Cl.[2] F02B *43/08*

U.S. Cl. 123—3 **2 Claims**



1. A method for reducing the concentration of a halogenated hydrocarbon compound, in a vapor phase of said compound, prior to releasing the vapor phase compound into the atmosphere, the method comprising:

mixing the vapor phase halogenated hydrocarbon compound with a sufficient amount of air to provide an oxidizable vapor phase mixture;

feeding the oxidizable vapor phase mixture into the combustion chamber of a Diesel engine, while the engine is operating;

compressing the oxidizable vapor phase mixture in the combustion chamber sufficiently for the vapor phase mixture to reach ignition temperature;

injecting a vapor phase fuel component into the combustion chamber, to mix with the oxidizable vapor mixture and thereby provide a vapor phase fuel mixture;

igniting the vapor phase fuel mixture to initiate an oxidation reaction which produces a vapor phase reaction product containing less than 20 percent by volume of the halogenated hydrocarbon compound; and

discharging the vapor phase reaction product from the engine into the atmosphere.

4,108,114

FUEL REFORMER FOR GENERATING GASEOUS FUEL CONTAINING HYDROGEN AND/OR CARBON MONOXIDE

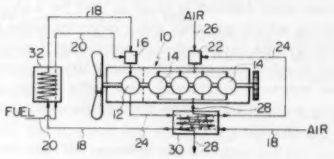
Katuaki Kosaka, Saitama, and Zene Ueno, Fuchu, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed May 26, 1976, Ser. No. 690,311

Claims priority, application Japan, May 27, 1975, 50-62487

Int. Cl.[2] F02B *43/08, 75/16, 3/00*

U.S. Cl. 123—3 **15 Claims**



1. A fuel reformer for carrying out a fuel-reforming reaction which gives a gaseous fuel containing as combustible components at least one of hydrogen and carbon monoxide through partial oxidation of at least one fuel selected from hydrocarbon fuels, alcohols, and nitrogen-hydrogen compounds without using any catalyst, the reformer comprising:

a single reaction chamber in the form of a combustion chamber of a compression-ignition internal combustion engine;

a piston adapted to compress a gas in said reaction chamber at a compression ratio in the range from about 14 to about 20;

a heat exchanger arranged to transfer heat from the reaction product discharged from said reaction chamber to at least one component of a gaseous mixture to be supplied to said reaction chamber;

a fluid feed means for selectively supplying to said reaction chamber either an oxygen-containing gas selected from the group consisting of oxygen and air when said heat exchanger is too cold to support said fuel-reforming reaction or said gaseous mixture comprising said at least one fuel and said oxygen-containing gas when said heat exchanger is sufficiently hot enough to support said fuel-reforming reaction, the amount of oxygen in said gaseous mixture being sufficient to accomplish partial oxidation but insufficient to accomplish complete oxidation of said at least one fuel in said gaseous mixture; and

a fuel injection means for pressurizing said at least one fuel and injecting the pressurized fuel into said reaction chamber only when said fluid feed means supplies said oxygen-containing gas alone to said reaction chamber in such a quantity that the injected fuel undergoes a complete oxidation.

4,108,115

FUEL INJECTION SYSTEMS FOR COMPRESSION IGNITION ENGINES

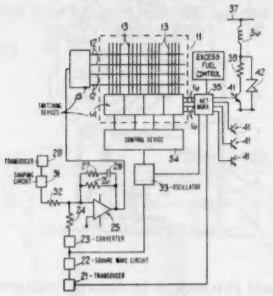
Malcolm Williams, Solihull, and Christopher Robin Jones, Alcester, both of England, assignors to Lucas Electrical Company, Limited, Birmingham, England

Continuation of Ser. No. 584,166, Jun. 5, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,740

Claims priority, application United Kingdom, Jun. 7, 1974, 25306/74

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EB **4 Claims**



1. A fuel injection system for a compression ignition engine comprising a first transducer producing an electrical output representing demand, a second transducer producing an electrical output representing engine speed, a memory device having first and second inputs and an output, said device being programmed to produce an output having a magnitude dependent on the magnitude of said inputs, means coupling the second transducer to said first input to represent engine speed, means coupling a combination of the output of the output of the first and second transducers to said second input to represent the load on the engine, and control means operable by the output from the memory device for determining the quantity of fuel injected to each cylinder of the engine, the system operating without any feedback representing the quantity of fuel injected wherein said means coupling the outputs of the first and second transducers to the second input includes a virtual earth summing amplifier, the transducers producing outputs increasing monotonically with demand and speed respectively.

4,108,116

COMBUSTION CHAMBER AND NOZZLE ARRANGEMENT FOR DIRECT FUEL INJECTION TYPE DIESEL ENGINE

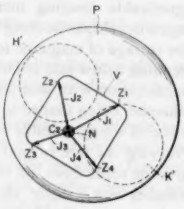
Tadao Ohta, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 803,914

Claims priority, application Japan, Jun. 9, 1976, 51-67265

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 A **1 Claim**



1. In a diesel engine including a cylinder, a cylinder head, a

piston slidably disposed in the cylinder and having a quandrangular cavity in its crown offset from the center of the piston, and a fuel injector nozzle disposed in the cylinder head and offset with respect to the center of the cavity for injecting four jets of fuel directed at points on the respective side walls of the cavity equidistant from the adjacent corners thereof, the improvement characterized by the rotational orientation of the cavity being such that:

a. the two longest and the two shortest fuel jet distances are equal in length,

b. a line connecting the geometric center of the cavity and the center of the nozzle bisects the angles between the two longest and the two shortest fuel jet directions, and

c. the difference between the lengths of the longest and shortest fuel jet distances is minimized.

4,108,117

FUEL METERING SYSTEM

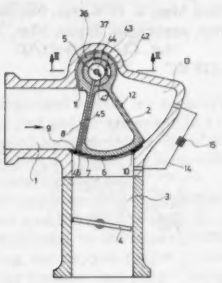
Gerhard Stumpp, Stuttgart; Wolf Wessel, Oberriexingen; Volkhard Stein, and Wolfgang Ripper, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

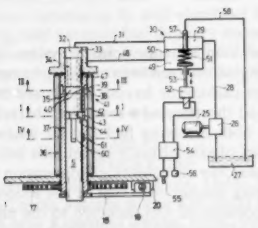
Filed Nov. 15, 1976, Ser. No. 741,642

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1975, 2554725

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—33 A **23 Claims**





1. In a fuel injection system which includes an air flow responsive member located substantially within the induction tube and further includes fuel metering means, coupled to said air flow responsive member, said induction tube further containing an arbitrarily controlled throttle, the improvement comprising:

air flow aperture means in said induction tube upstream of said throttle;

said air flow responsive member is disposed upstream of said aperture means and is a movable valve element whose cross section in a plane parallel to the air flow is substantially a sector of a circle, said sector defining a narrow end, an arc-shaped wide end, and side walls therebetween, said valve element being disposed to pivot at its narrow end about a shaft lying adjacent to one side of the induction tube, such that one of said side walls is substantially perpendicular to the incoming air flow and its edge adjacent to said arc shaped end cooperates with said aperture means to thereby define a variable free flow cross section for air through said induction tube; and

said fuel metering means is located in and around the pivotal shaft of said valve element and fuel is metered thereby as a function of the pivotal position of said valve element and is delivered to the induction tube in the immediate vicinity of said edge of said valve element.

4,108,118

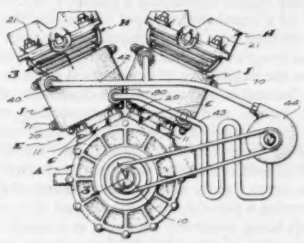
WATER JACKETED CYLINDER

Robert Jay George, 4248 Via Marina, Marina Del Rey, Calif. 90291

Filed Dec. 9, 1976, Ser. No. 748,951

Int. Cl.[2] F01P *3/02*

U.S. Cl. 123—41.57 **4 Claims**

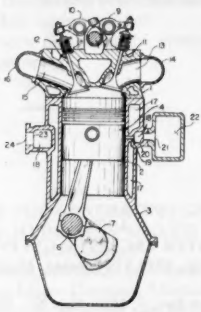


1. A reciprocating cylinder and piston internal combustion engine comprising a crank case, a crank shaft rotatably carried by the case on a horizontal axis, a cylinder unit including an elongate tubular cylindrical body defining a central upwardly and downwardly opening bore, means mounting the body on the case to project substantially vertically and upwardly therefrom with its lower end communicating with the interior of thd case, an air-cooled head structure with fuel supply, ignition and gas exhaust means positioned at and closing the upper end of the bore, means securing the head to the body, a piston and ring assembly slidably engaged in the bore and a connecting rod pivotally and rotatably connected with and extending between the piston assembly and the crank shaft, said cylinder unit including a jacket structure with a cylindrical side wall in radial outward spaced relationship about the body and having upper and lower ends in sealed engagement with the body below the head and above the case, said jacket and body defining an annular longitudinally extending chamber about the body, a water inlet port in the jacket, a water outlet port in the jacket spaced from the inlet port, a re-circulating pump with an inlet and an outlet, a fluid conducting delivery line from the pump outlet to the inlet port, a fluid conducting return line from the outlet port to the pump inlet and a volume of heat transfer fluid in the chamber, pump and lines; said body has a hot spot at its upper portion and at one side thereof where the piston assembly is urged to generate friction heat upon each downward power stroke of the piston in the cylinder, said inlet port being positioned in the jacket and disposed to direct fluid flowing therethrough and into said chamber toward and across the said hot spot.

4,108,119
BOTTOM CYCLE MANIFOLD FOR FOUR-STROKE INTERNAL COMBUSTION ENGINES

Edward Milton McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Filed Jan. 19, 1977, Ser. No. 760,560
Int. Cl.[2] F02B *75/02*
U.S. Cl. 123—75 C **1 Claim**

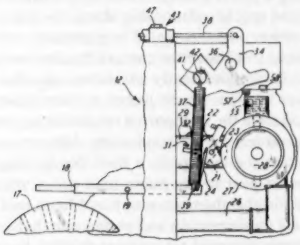


1. A four-stroke cycle piston driven internal combustion engine, said engine containing a plurality of cylinders fixedly attached to a crankcase, poppet valves for the induction of air-fuel charges into said cylinder, said poppet valves being located in combustion chambers above said cylinders, poppet valves for the exhausting of combustion gases from said cylinders also located in said combustion chambers, pistons slidably mounted within said cylinders, connecting rods pivotally mounted in said pistons at one end and rotatively mounted on crankpins at the other end, aligned arms fixedly attached to each end of said crankpins, opposing said arms between said crankpins being fixedly attached to each end of axially aligned shafts forming a plurality of crank throws of a crankshaft, said crankshaft being rotatively mounted in journals in said crankcase, a plurality of side ports in said cylinder walls at a level which is above the face of said pistons when said pistons are at the bottom of their stroke, a manifold connecting said side-ports, a duct opening into said manifold leading directly to a pressurized air source, another duct opening in said manifold leading directly to ambient atmosphere.

4,108,120
GOVERNOR CONTROL FOR AN INTERNAL COMBUSTION ENGINE

Neill Carl Woelffer, Racine, Wis., assignor to Jacobsen Manufacturing Company, Racine, Wis.

Filed Feb. 25, 1977, Ser. No. 771,927
Int. Cl.[2] F02D *11/02, 11/08*
U.S. Cl. 123—103 B **11 Claims**

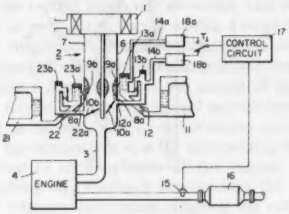


1. In a governor control for an internal combustion engine, an engine, a pivotally mounted throttle plate movable between open and closed positions, a member movably mounted for movement in self-response to the speed of the engine and being operatively connected with said throttle plate for moving said throttle plate relative to said open and closed positions, a tension spring operatively connected with said member for yieldingly urging said member toward a position corresponding to the open throttle position, an operator-controlled mechanism connected with said spring and thereby be operatively connected with said throttle plate for manually moving said throttle plate toward the open and closed positions, the improvement comprising said operator-controlled mechanism including a movably mounted control mechanism having a first position corresponding to a fast engine speed and having a second position corresponding to a slow engine speed, said control mechanism being free of restriction and movable away from the slow engine speed position and having a third position which is located past the fast engine speed position and which corresponds to an engine speed faster than the fast engine speed, and an additional spring operatively connected with said control mechanism for yieldingly urging said control mechanism from said third position toward second position.

4,108,121
CLOSED LOOP MIXTURE CONTROL SYSTEM USING A TWO-BARREL CARBURETOR

Hidehiro Minami, No. 1403, Matano-cho, Totsuka-ku, Yokohama City, and Makio Waku, 1-22-6,, Moto-machi, Urawa City, both of Japan

Filed Mar. 9, 1976, Ser. No. 665,257
Claims priority, application Japan, Mar. 24, 1975, 50-39116
Int. Cl.[2] F02D *35/00*
U.S. Cl. 123—119 EC **7 Claims**



1. A closed loop mixture control system for an internal combustion engine of a roadway vehicle, comprising:

a two-barrel carburetor having a primary barrel having a venturi and throttle and a secondary barrel in said carburetor for both receiving fuel and air when depression at the venturi of said primary barrel falls below a predetermined value, the cross-sectional dimension of the primary barrel being smaller than that of the secondary barrel so that evaporation of fuel inducted to the primary barrel is promoted as compared to the evaporation of fuel inducted to the secondary barrel;

means for producing a control signal corresponding to the difference between an air-fuel ratio of the mixture combusted in the engine and a stoichiometric air-fuel ratio of the mixture;

primary and secondary metering systems associated with the primary and secondary barrels, respectively, for proportioning air and fuel supplied to said engine, said primary metering system comprising a main mixture supply nozzle disposed in the venturi of the primary barrel, means defining an auxiliary mixture supply port disposed in the closed position of the throttle of the primary barrel, a first mixture control valve associated with said main mixture supply nozzle, a second mixture control valve associated with said auxiliary mixture supply port, a throttle position detector operatively connected to the throttle of the primary barrel, and means for selectively coupling said con-

trol signal to said first and second control valves in response to a predetermined throttle position of the primary barrel and effective so that said control signal is applied to the second control valve for part throttle operation and to the first control valve for full throttle operation; and

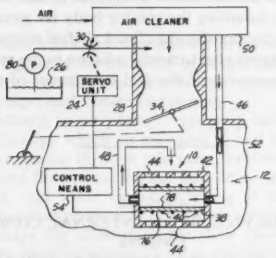
means for controlling said primary metering system in accordance with said control signal.

4,108,122

AIR/FUEL RATIO FOR AN INTERNAL COMBUSTION ENGINE CONTROLLED BY GAS SENSOR IN INTAKE MANIFOLD

Daniel Dewey Barnard, Farmington Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 573,508, Apr. 30, 1975, abandoned.
This application Jan. 28, 1977, Ser. No. 763,378
Int. Cl.[2] F02B *33/00*; F02M *25/00*
U.S. Cl. 123—119 EC **8 Claims**



1. In a fuel management system for an internal combustion engine wherein the fuel and air are mixed in a mixture control means and distributed through intake manifold means to the cylinders of the engine, a system for controlling the air/fuel ratio in the fuel mixture comprising:

variable fuel delivery means for controlling the amount of fuel discharged into the mixture control means;

sensor means positioned in the intake manifold means for directly sensing the oxygen partial pressure in the fuel mixture flowing thereby, said sensor having an electrical characteristic which varies in response to changes in said oxygen partial pressure; and

control means responsive to said electrical said sensor for controlling said variable fuel delivery means and controlling the quantity of fuel discharged into the mixture control means in accordance with a function of said electrical characteristic.

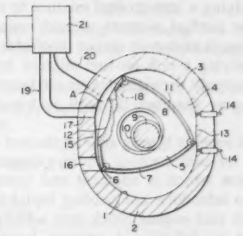
4,108,123

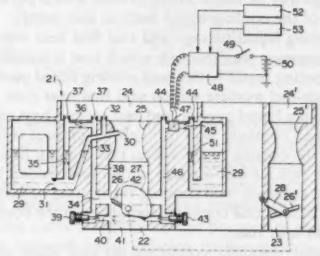
CARBURETOR

Ryozo Ito, Toyota, and Akira Tokuda, Oobu, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoto and Aisan Kogyo Kabushiki Kaisha, Oobu, both of, Japan

Filed Mar. 29, 1977, Ser. No. 782,345
Claims priority, application Japan, Jul. 30, 1976, 51-91638; Jul. 30, 1976, 51-91639
Int. Cl.[2] F02B *33/00*
U.S. Cl. 123—119 EC **7 Claims**

1. A carburetor for use with a stratified-charged rotary piston engine, comprising a first supply system having an air flow passage, a throttle valve, a main fuel supply system and a main slow/idle fuel supply system, and a second supply system having an air flow passage and a throttle valve which is operationally co-related with the throttle valve in said first supply system, wherein the improvement comprises a second slow/idle fuel supply system provided in one of said first and second supply systems said second slow/idle fuel supply system having a control valve which selectively intercepts the flow of fuel through said second slow/idle fuel supply system, a first sensing means for sensing the speed condition of the engine, a second sensing means for sensing the temperature condition of the exhaust gas of the engine, and the control means for controlling said control valve depending upon the information received from said first and second sensing means in a manner





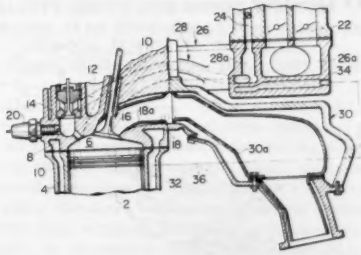
such that the flow of fuel through said second slow/idle fuel supply system is intercepted when the engine speed is above a predetermined low level and the exhaust gas temperature is above a predetermined value.

4,108,124

MANIFOLD SYSTEM

Yasuhiko Nakagawa, Fujisawa, and Kosabro Mukai, Tokyo, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Apr. 9, 1976, Ser. No. 675,624
Claims priority, application Japan, Apr. 10, 1975, 50-43537
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 AC **4 Claims**



1. In an engine system:

an internal combustion engine comprising a cooling system having a cooling liquid passageway with a thermostat and a pump for the cooling liquid, and an engine block having an auxiliary combustion chamber, a main combustion chamber and a passage interconnecting said auxiliary and said main combustion chambers;

a main intake manifold having a first riser and at least one

first manifold passage extending from said first heat riser toward said main combustion chamber;

an auxiliary intake manifold having a second heat riser and at least one second manifold passage extending from said second heat riser toward said auxiliary combustion chamber;

means for supplying a lean air-fuel mixture to said first riser to supply the air-fuel mixture to said main combustion chamber through said main intake manifold;

means for supplying a rich air-fuel mixture to said second heat riser to supply the rich air-fuel mixture to said auxiliary combustion chamber through said auxiliary intake manifold;

a cooling liquid passage having an inlet thereof connected to that portion of said cooling liquid passageway of said cooling system which is adjacent and upstream of said thermostat to introduce hot cooling liquid having circulated through said engine block into said cooling liquid passage, said cooling liquid passage having an outlet thereof connected to that portion of said cooling liquid passageway of said cooling system which permits return flow of the cooling liquid back to said pump,

said cooling liquid passage and said first heat riser having a first common wall through which heat is transferred from the cooling liquid within said cooling liquid passage to the lean air-fuel mixture within said first heat riser.

said cooling liquid passage and said second heat riser having a second common wall through which heat is transferred from the cooling liquid within said cooling liquid passage to the rich air-fuel mixture within said second heat riser;

said first common wall forming the bottom of said first heat riser, said second common wall forming the bottom of said second heat riser;

an exhaust manifold connected to said main combustion chamber to receive exhaust gases from combustion within said main combustion chamber, said exhaust manifold being out of heat conductive contact with said main intake manifold and said auxiliary intake manifold;

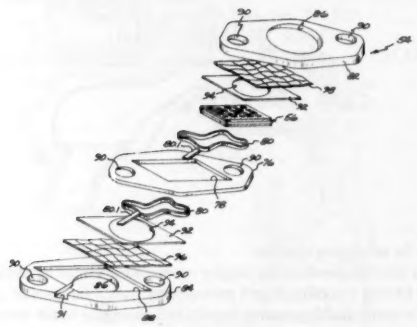
whereby the lean and rich air-fuel mixtures are heated with the cooling liquid passage without causing an appreciable drop of the temperature of the exhaust gases within said exhaust manifold.

4,108,125

HIGH EFFICIENCY EARLY FUEL EVAPORATION CARBURETION SYSTEM

Leo Marcoux, Rehoboth, and Peter G. Berg, Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 10, 1976, Ser. No. 722,310
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 F **8 Claims**



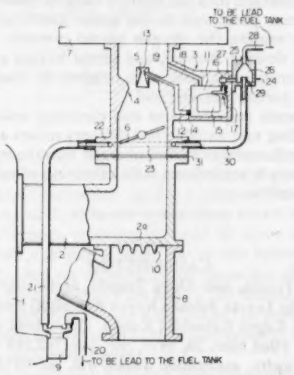
1. A carburetion system comprising carburetor means having an air-fuel passage, an air-inlet to the air-fuel passage, a fuel inlet to the air-fuel passage for mixing fuel with air in the air-fuel passage, and an outlet from the air-fuel passage for delivering a mixture of air and vaporized fuel to an engine, heater means comprising a body of electrical resistor material of positive temperature coefficient of resistivity having a plurality of heater passages extending in a pattern in spaced side-by-side relation to each other through the body between opposite ends of the body defining a plurality of webs of the resistor material between the heater passages, electrically conductive contact means in electrical engagement with the resistor material on the inner walls of the heater passages, a first electrically conductive interconnection coating on one end of the resistor body electrically connecting the contact means in alternate ones of the heater passages together at said one end of the body, a second electrically conductive interconnection coating on the opposite end of the resistor body electrically connecting the contact means in the other heater passages together at said opposite end of the body, means for directing electrical current through the body between contact means connected to said first coating and contact means connected to said second coating, and means mounting the resistor body for passing at least part of at least one constituent of said air-fuel mixture through the heater passages in heat-transfer relation to the resistor body to facilitate vaporizing of the fuel constituent of the air fuel mixture.

4,108,126

FUEL FEED DEVICE OF AN INTERNAL COMBUSTION ENGINE

Masakatsu Sanada, Toyota, and Masahiko Nakada, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1977, Ser. No. 793,637
Claims priority, application Japan, Mar. 15, 1977, 52-27559
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 E **9 Claims**



1. A fuel feed device of an internal combustion engine, comprising:

a carburetor having a float chamber therein;

a fuel reservoir; a fuel supply passage communicating said float chamber with said fuel reservoir and having a passage portion arranged to cool said carburetor and to vaporize the low boiling components in the fuel by the heat of said carburetor, and;

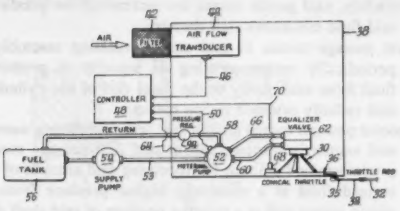
a separating means disposed in said fuel supply passage between said passage portion and said float chamber for respectively separating low boiling components and high boiling from the fuel and for removing said low boiling components from the fuel fed into said float chamber.

4,108,127

MODULATED THROTTLE BYPASS

Leonard Lee Chapin, and James Walter Merrick, both of El Paso, Tex., assignors to Autotronic Controls, Corp., El Paso, Tex.

Filed Apr. 1, 1977, Ser. No. 783,614
Int. Cl.[2] F02D *1/04, 35/00, 33/00;* F02B *15/00*
U.S. Cl. 123—124 R 24 Claims



1. An auxiliary air control system for an internal combustion engine having an intake manifold to which the flow of air is controlled by operation of a main throttle valve operated by an engine operator, said system comprising

means defining an air passage bypassing said main throttle valve through which air may pass to said intake manifold without passing through said main throttle valve,

valve means for controlling the flow of air through said air passage, said valve means including at least one valve member mounted for movement to control opening of said air passage for controlling air flow therethrough, and drive means responsive to a valve control signal for driving said valve member to move to a controlled position in said air passage, and

control means including a manifold pressure sensor responsive to manifold pressure by producing a manifold pressure signal systematically related to manifold pressure, means for establishing a manifold pressure reference signal corresponding to a predetermined manifold pressure, means responsive to said manifold pressure signal and said manifold pressure reference signal by producing a manifold pressure control signal for causing said drive means to drive said valve member to the controlled position whereat air flow through said air passage produces a sensed manifold pressure corresponding to said predetermined manifold pressure, and means for applying said manifold pressure control signal to said drive means as said valve control signal.

13. An auxiliary air control system for an internal combustion engine having an intake manifold to which the flow of air is controlled by operation of a main throttle valve operated by an engine operator, said system comprising

means defining an air passage bypassing said main throttle valve through which air may pass to said intake manifold without passing through said main throttle valve,

valve means for controlling the flow of air through said air passage, said valve means including at least one valve member mounted for movement to control opening of said air passage for controlling air flow therethrough, and drive means responsive to a valve control signal for driving said valve member to move to a controlled position in said air passage, and

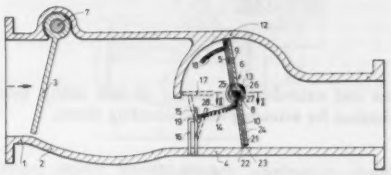
control means including an air flow sensor responsive to the total flow of air into said intake manifold by producing an air flow signal systematically related to the rate of total air flow into said manifold, means for establishing an air flow reference signal corresponding to a predetermined rate of total air flow into said manifold suitable for engine idling, means responsive to said air flow signal and said air flow reference signal by producing an air flow control signal for causing said drive means to drive said valve member to the controlled position whereat air flow through said air passage produces a sensed total rate of air flow into said manifold corresponding to said predetermined rate of air flow, and means for applying said air flow control signal to said drive means as said valve control signal.

4,108,128

FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Heinrich Knapp, Leonberg-Silberberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 23, 1976, Ser. No. 744,363
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555996
Int. Cl.[2] F02M *39/02*
U.S. Cl. 123—139 AW 12 Claims



1. In a fuel supply system for an internal combustion engine, said engine including an air induction tube containing an air flow rate meter and, seriatim, an arbitrarily actuated throttle plate pivoting on a shaft, said air flow rate meter being subjected to a restoring force and being coupled operatively to a fuel metering valve assembly for the purpose of metering out fuel to the induced air in relation to the air flow rate, the improvement comprising:

a fuel mixture generating member, mounted to pivot around said shaft of said throttle plate;

a bulging region of the induction tube configured to receive a portion of said pivoting mixture generating member during pivotal motions thereof;

adjustable spring means, attached to said mixture generating member to urge the same to pivot in the opposite direction from that urged by the air flow; whereby said mixture generating member is displaced by the air flow and tends to follow the motions of said throttle plate, the force of said spring means being such that the pressure drop across said mixture generator in the upper region of the partial engine load domain is selectable and is reducible in the full-load position of said throttle plate.

4,108,129

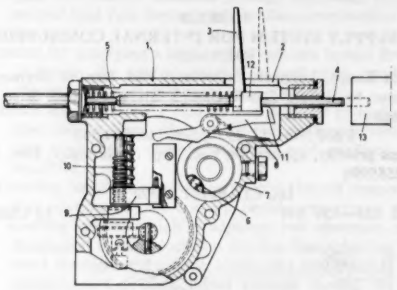
SAFETY GROUP FOR DIESEL ENGINES

Armand Rognon, 22 rue Géo-Lufbéry, Chauny (Aisne), France

Filed Nov. 22, 1976, Ser. No. 743,912
Claims priority, application France, Dec. 1, 1975, 75 36721
Int. Cl.[2] F02B *77/08*
U.S. Cl. 123—139 AZ 8 Claims

1. In a diesel engine including a fuel pump, with a fuel pump rack-bar, air intake manifolds, each incorporating a throttle plate, means for actuating said throttle plates, and a power supply for said actuating means: a safety control system comprising a safety shut-down mechanism, means for controlling said throttle plate actuating means and connected to said power supply, an oil pressure release valve connected to said safety shut-down mechanism, an unsafe engine operating condition detecting means for controlling said release valve, said safety shut-down mechanism including a spring loaded piston engaging said rack-bar, a trigger engaging said piston, a governor driven by the engine and responsive to engine over-speeding, a sliding member responsive to failure in engine lubricating oil pressure, said governor and sliding member being capable of actuating said trigger for disengaging said trigger from said piston and thus releasing said piston, whereby said rack-

bar engaged by said piston is urged, under the action of said spring, to idle position, a lever being fixedly secured to said



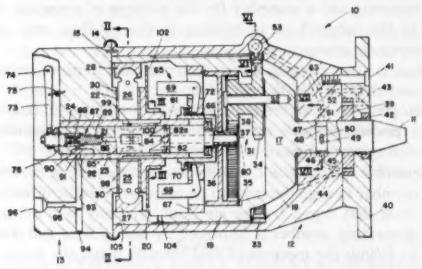
piston and extending outwardly of said safety shut-down mechanism for actuating said controlling means.

4,108,130

FUEL INJECTION PUMP

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 18, 1977, Ser. No. 798,053
Int. Cl.[2] F02M *41/06*
U.S. Cl. 123—139 AQ **14 Claims**



1. A distributor fuel pump assembly for an engine having a plurality of cylinders comprising:

a housing including a generally hollow cylindrical first portion and a second portion affixed to the first portion to form a substantially closed interior cavity, said second portion having a plurality of ports adapted for connection to the plurality of engine cylinders;

a first rotating assembly journalled for rotation in said cavity, said first rotating assembly defining an eccentric inner bore proximate said second portion, said first rotating assembly including an integrally formed shaft means extending outwardly of said cavity distal of said second portion;

a second rotating assembly journalled for rotation in said second portion and extending inwardly of said eccentric bore;

planetary gear means including a ring gear associated with said housing for drivingly connecting said first rotating assembly with said second rotating assembly to cause said second rotating assembly to rotate at a predetermined speed proportional to the speed of rotation of said first rotating assembly;

governor means associated with said second rotating assembly for causing axial movement in said cavity of said second rotating assembly in a first direction away from said first rotating assembly proportional to increased speed of rotation of said second rotating assembly;

means responsive to engine speed for rotating said ring gear relative to said housing;

means for communicating fluid to the interior of said cavity;

radially oriented piston means formed in said second portion, said piston means including a cylinder, a piston mounted for reciprocation in said cylinder and a slipper adapted to engage the eccentric inner bore of the first rotating assembly, said slipper associated with said piston, and resilient means for urging said piston radially outwardly, said piston means for increasing the pressure of said fluid communicated thereto;

first passage means in said second rotating assembly for periodically communicating an amount of pressurized fluid from said cavity to the inner end of the cylinder of said radially oriented piston means;

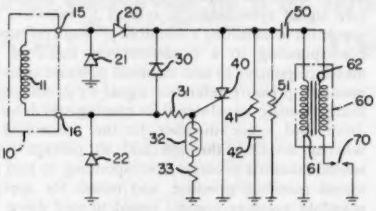
second passage means also in said second rotating assembly and angularly displaced from said first passage means a predetermined amount for receiving said amount of pressurized fluid at a relatively higher pressure from said piston means and at a rotative position of said shaft determined by the means responsive to engine speed, said second passage means for communicating said amount of higher pressurized fluid to one of the plurality of ports adapted for connection to the plurality of cylinders.

4,108,131

CAPACTIVE DISCHARGE IGNITION CIRCUIT

Suetaroo Shibukawa, Ibaraki, Japan, assignor to Hitachi, Ltd., Japan

Filed Sep. 7, 1976, Ser. No. 720,640
Claims priority, application Japan, Sep. 5, 1975, 50-107015
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 CC **15 Claims**



1. A capacitive discharge ignition circuit for an internal combustion engine comprising:

a magneto operably connected to the engine and having at least one winding;

a spark plug transformer having primary and secondary windings;

a storage capacitor connected to said magneto winding for being charged with the output voltage of said magneto during the first half cycle thereof;

a thyristor connected to said storage capacitor for forming a discharge circuit for said storage capacitor together with said primary winding:

resistance means connected to the gate of said thyristor across which the voltage appears during the second half cycle, the voltage across said resistance means being applied to the gate of said thyristor,

a diode for forming a closed circuit together with said thyristor and said resistance means so as to remove the voltage from said gate once said thyristor is fired; and

further comprising a diode connected between said magneto winding and a reference potential so that it conducts thereby inhibiting the output of said magneto winding from being applied to said resistance means during the first half cycle.

4,108,132
INTERNAL COMBUSTION ENGINE HAVING AN IMPROVED INLET VALVE ARRANGEMENT

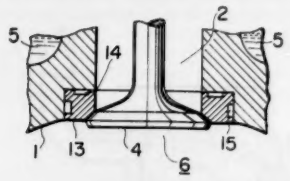
Yoshimasa Hayashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Nov. 9, 1976, Ser. No. 740,235

Claims priority, application Japan, Nov. 10, 1975, 50-151719[U]

Int. Cl.[2] F01L *3/00*

U.S. Cl. 123—188 S **7 Claims**



1. In an internal combustion engine, a cylinder head having an inlet port which opens into a combustion chamber, a valve seat insert securely disposed in an orifice of the inlet port, and an inlet valve having a head seatable on said valve seat insert to prevent fluid communication between the combustion chamber and the inlet port, the improvement comprising:

thermal insulation means arranged between said valve seat insert and said cylinder head and adapted to insulate a sufficient portion of the interface defined between the valve seat insert and the cylinder head so that during the operation of the internal combustion engine the transfer of heat from the valve seat insert and the valve head to the cylinder head is limited to raise the temperature of the valve seat insert and the valve and to reduce the thickness of the layer of air-fuel mixture in contact with and in the immediate vicinity of the surfaces of the valve seat insert and the valve head exposed to the interior of the combustion chamber.

4,108,133
INTERNAL COMBUSTION ENGINE HAVING AN AUXILIARY COMBUSTION CHAMBER WITHOUT AN INTAKE VALVE

Masami Konishi, Toyota; Norihiko Nakamura, Mishima; Tatsuo Kobayashi, and Toyokazu Baika, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 538,405, Jan. 3, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,463

Claims priority, application Japan, Jul. 31, 1974, 49-87802; Jul. 31, 1974, 49-87803; Jul. 31, 1974, 49-87804

The portion of the term of this patent subsequent to Sep. 14, 1993, has been disclaimed.

Int. Cl.[2] F02B *23/00*

U.S. Cl. 123—191 S **4 Claims**

1. An internal combustion engine comprising:

a cylinder;

a cylinder head;

a reciprocable piston snugly received in said cylinder;

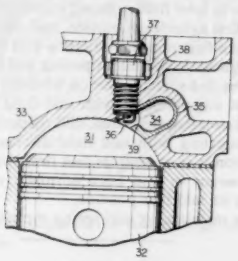
said cylinder head and said piston defining a main combustion chamber therebetween;

means defining a blind hole in said cylinder head, the open end of said blind hole opening into said main combustion chamber and the opposite end of said blind hole most remote from said main combustion chamber being completely closed;

an auxiliary combustion chamber shell defining an auxiliary combustion chamber therein, said shell being pressedly fitted in said blind hole from the main combustion chamber so that the entire exterior surface of the auxiliary combustion chamber shell tightly contacts the wall of the blind hole, said auxiliary combustion chamber having no intake valve;

a passage communicating said auxiliary combustion chamber with said main combustion chamber; and

an ignition spark plug having an electrode positioned in said passage whereby a substantially uniform lean fuel-air



mixture, drawn into the main combustion chamber through an intake valve on the intake stroke of the piston, is forced into the auxiliary combustion chamber on the compression stroke of the piston and ignited and burned thereby igniting and burning the lean fuel-air mixture in the main combustion chamber by the torch flame via said passage from the auxiliary combustion chamber.

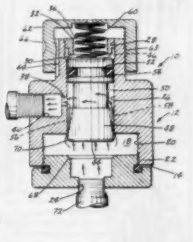
4,108,134
MODULATOR VALVE

Jerry P. Malec, 10524 E. Pine, Tulsa, Okla. 74116

Filed Jun. 25, 1976, Ser. No. 699,937

Int. Cl.[2] F01M *1/00*

U.S. Cl. 123—196 R **9 Claims**



1. A modulator valve assembly comprising,

a valve body having an elongated bore formed therein having opposite ends, said valve body having a first compartment area formed therein adjacent one end of said bore and communicating therewith,

a fluid inlet opening in said body communicating with said first compartment area,

a fluid discharge opening formed in said valve body communicating with said bore intermediate the ends thereof,

a piston slidably mounted in said bore,

said piston having a first cylindrical portion at one end thereof with a diameter substantially equal to the diameter of said bore, said first cylindrical portion having an end portion positioned adjacent said first compartment area,

said piston having a reduced diameter portion intermediate the ends thereof between said first cylindrical portion and the other end of said piston,

a seal means embracing said piston between said reduced diameter portion and said other end of said piston which sealably and slidably engages the wall surface of said bore,

said piston having at least one elongated metering slot

formed in the periphery of said first cylindrical portion, said metering slot having one end thereof spaced from said end portion of said first cylindrical portion and having a second end communicating with said reduced diameter portion, said slot being substantially V-shaped in cross-section and progressively increasing in depth and width from its said one end to its said second end,

said piston being movable in one direction in said bore in response to inlet fluid pressure exerted on said end portion of said first cylindrical portion, said piston being movable between a first position whereby said metering slot communicates with said inlet opening and said first compartment area to a second position whereby said metering slot does not communicate with said fluid inlet opening and said first compartment area, said reduced diameter portion communicating with said fluid discharge opening when said piston is in at least its said first position,

a spring means in said bore normally urging said piston towards its said first position,

and means maintaining said spring means in said bore,

and adapted to supply oil at a predetermined pressure to said annular chamber means; and

means permitting escape of said oil from said minimal clearance between said cylinder liner and said cylinder block, whereby said oil flows into said annular chamber, slowly seeps downwardly through the clearance between the bore and the cylinder liner in order to prevent fretting corrosion between the innerwall of the cylinder block and the outer surface of the cylinder liner, and flows out through said escape means.

4,108,135

ARRANGEMENT FOR EXTERNAL OILING OF CYLINDER LINERS OF INTERNAL COMBUSTION ENGINES

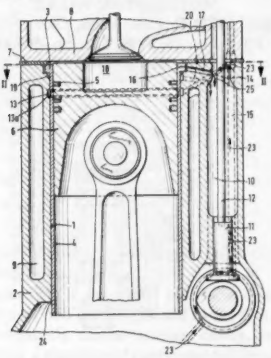
Heribert Kubis, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 796,884

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621348

Int. Cl.[2] F01M *1/00*

U.S. Cl. 123—196 R **7 Claims**



1. An internal combustion engine which comprises:

a cylinder block having a bore;

a cylinder head arranged above said cylinder block and connected thereto;

a cylinder liner detachably inserted into said bore so as to form at least a minimal clearance between said cylinder liner and said cylinder block, said cylinder liner having a radially outwardly extending flange provided at the cylinder head end of said cylinder liner;

a piston reciprocably mounted in said cylinder liner, and with said cylinder head defining a combustion chamber, at least one piston ring associated with said piston;

annular chamber means provided in at least one of said cylinder block and said cylinder liner and located therebetween, at least one annular space being formed between said cylinder liner and said cylinder block and being located between said annular chamber means and said cylinder head as close as possible to the latter in order to prevent oil pressure build up between the cylinder liner and the cylinder block;

a feed line communicating with said annular chamber means

4,108,136

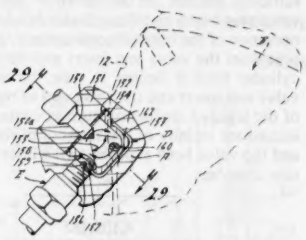
INTERNAL COMBUSTION ENGINE CONTROL SYSTEM

Laszlo Hideg, Dearborn, and Robert P. Ernest, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 636,184, Nov. 28, 1975, Pat. No. 4,060,058. This application May 26, 1976, Ser. No. 691,050

Int. Cl.[2] F02B *53/10*

U.S. Cl. 123—209 **5 Claims**



1. A prechamber fuel injection system for use in an Otto cycle rotary internal combustion engine having wells defining a main combustion chamber which undergoes rotation and translation, the combination comprising:

(a) a heat conductive thin wall capsule having a generally spherical interior portion and an open end opposite said spherical portion,

(b) means for selectively providing spark ignition within said capsule and having spark ignition electrodes arranged on an axis and with a gap therebetween projecting into said prechamber,

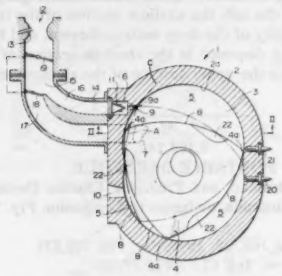
(c) fuel injection means arranged to close the open end of said capsule except for a heat conductive nozzle extending centrally through said closed end, said fuel injection means being effective to inject a conical spray of fuel droplets into said prechamber with the axis and spread of said conical spray arranged to prevent concentrations of droplets throughout said prechamber and to prevent direct contact of droplets with said electrodes,

(d) walls defining an outlet from said capsule through which a gaseous mixture from said main combustion chamber of said engine is introduced to said capsule, said outlet having an axis generally tangent to the spherical interior volume of said capsule to induce toroidal flow upon introduction of said gaseous mixture from said main combustion chamber, the axes of said cone, spark electrodes and outlet are each at generally right angles with respect to each other.

4,108,137
ROTARY PISTON ENGINES

Kenichi Yamamoto; Yutaka Hirose, and Tooru Maeda, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Division of Ser. No. 639,705, Dec. 11, 1975, Pat. No. 4,030,454.
This application May 4, 1976, Ser. No. 682,896
Claims priority, application Japan, Feb. 28, 1975, 50/25480; Feb. 28, 1975, 50-25481; Apr. 1, 1975, 50-40032; Sep. 29, 1975, 50-118092
Int. Cl.[2] F02B *53/06*
U.S. Cl. 123—242 16 Claims



1. Rotary piston engines which comprise a casing including a rotor having an inner wall of a multi-lobed trochoidal configuration and a pair of side housings secured to the opposite sides of the rotor housing to define therein a cavity of multi-lobed trochoidal configuration and a substantially polygonal rotor disposed in said cavity for rotation with apex portions in sliding engagement with the inner wall of the rotor housing so that working chambers of variable volume are defined between the inner wall of the rotor housing and flanks of the polygonal rotor, first intake port means formed in said rotor housing, second intake port means formed in at least one of said side housings and having an effective area which is larger than that of the first intake port means, first intake passage means connected with the first intake port means, second intake passage means connected with the second intake port means, means for supplying fuel to said first and second intake passage means, throttle valve means provided in said first intake passage means, control valve means provided in said second intake passage means, and control means for closing said control valve means under an engine load below a predetermined value and opening under the engine load beyond said predetermined valve so that the fuel is supplied to said working chamber only through said first intake port means when the engine load is below the predetermined value.

4,108,138
COOKING OVEN AND METHOD OF MANUFACTURE

Christian Petin, 8 The Hemlocks, Roslyn Estates, N.Y. 11576, and Robert Richardson, Glen Head, N.Y., assignors to Christian Petin, Roslyn Estates, N.Y.

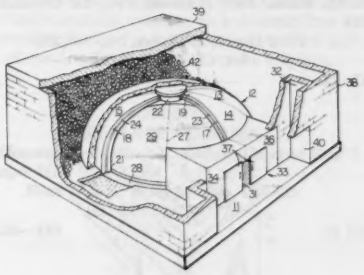
Filed Jul. 1, 1976, Ser. No. 701,564
Int. Cl.[2] A21B *1/28*
U.S. Cl. 126—19 R 3 Claims

2. The method of making an oven comprising the steps of:

casting refractory fire-resistant sectors of a hemispherical dome, each sector being defined by a small end and a large end and hemispherically longitudinal edges between the large end and the small end;

casting a substantially flat refractory base to form a cooking surface for simultaneously receiving food to be cooked and burning solid fuel on different areas of the cooking surface;

assembling a plurality of the sectors to form a dome with only a single opening in a limited region of the lower portion thereof adjacent the base, said single opening serving as an access opening for the food and solid fuel and also comprising the only egress opening for the discharge of combustion products from said oven; and

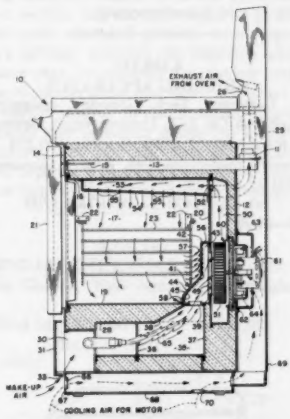


sealing the abutting edges of the sectors together with fire-resistant mortar.

4,108,139
CONVECTION OVEN

John W. Gilliom, and Robert H. McFarland, both of Mansfield, Ohio, assignors to The Tappan Company, Mansfield, Ohio

Filed Apr. 12, 1976, Ser. No. 675,958
Int. Cl.[2] A21B *1/00;* F24C *1/00;* A23C *3/00*
U.S. Cl. 126—21 A 31 Claims



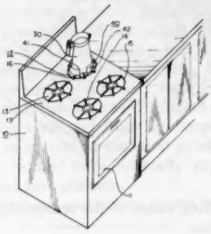
1. In a blower powered convection oven, a blower which receives an outflow of the oven air to be recirculated and an inflow of heated room air for charging the oven, the oven being vented, an air mixing chamber having an inlet portion, a mixing portion and an outlet portion, means providing communication between said outlet portion and the inlet of the blower, means for delivering the oven outflow to the inlet portion of the mixing chamber, and means for delivering the heated room air likewise to said inlet portion, whereby the oven outflow and heated room air are comingled in passage through the mixing portion of the chamber and supplied as a mixture thereof to the inlet of the blower for hot air feed to the oven.

4,108,140

COFFEE POT HOLDER FOR RECREATIONAL VEHICLE STOVE AND THE LIKE

Martin H. Wolze, 3007 Hermosa Ave., La Crescenta, Calif. 91214

Filed Dec. 3, 1976, Ser. No. 747,201
Int. Cl.[2] F24C *15/10*
U.S. Cl. 126—24 **2 Claims**



1. A pot retainer for cooking stoves comprising an elongated flexible member of sheet metal including a wall portion which is bendable to define a generally tubular shape;

a plurality of leg members extending laterally from said wall portion whereby said leg members define a plurality of outward extending feet for engagement with the periphery of a burner opening in a cooking stove to retain said member in a generally tubular shape and adjacent to said opening;

the spring characteristic of said flexible member tending to return the member to a generally planar position to mechanically bias said feet radially outward against the periphery of said opening;

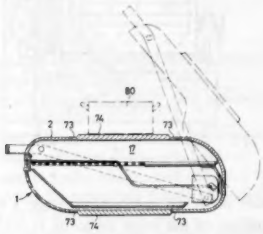
wherein said leg members are angled inward when said member is in a generally tubular shape, and said feet are angled outward to define a region for locking against the periphery of said burner opening.

4,108,141

GRILLING APPARATUS

Hans Bauer, Dettingen, Teck, Germany, assignor to Dietzmentall GmbH & Co. KG., Unterensinger, Germany

Filed May 27, 1976, Ser. No. 690,379
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1975, 7526494[U]; Oct. 24, 1975, 2547585
Int. Cl.[2] A47J *37/00*; F24B *3/00*
U.S. Cl. 126—41 R **5 Claims**



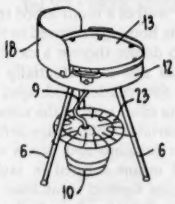
1. In a grill assembly, a grill tub having a planar lower surface, a heating element disposed in the tub, a hood having a planar upper surface, the hood and tub having identical shapes, means mounting the hood for pivotal movement with respect to the tub between a closed position and at least one open position, the upper surface of the hood exhibiting a first aperture, and a first insert member supported within the first aperture and having a peripheral surface cooperable with the surrounding first aperture to define at least one first circumferential air passage therebetween, the first air passage effecting communication between the outside air and the interior of the assembly when the hood is in the closed position, the hood and the grill tub defining identical axially coextensive unitary housings each having a relatively deep section and an adjacent relatively shallow section, the pivotal mounting means supporting the hood in confronting axially coextensive symmetrical relation with the grill tub when the hood is in its closed position whereby the shallow section of the hood overlies the deep section of the tub and the deep section of the hood overlies the shallow section of the tub to yield a substantially closer contour, the upper surface of the hood conforming to the lower surface of the tub, the shallow section of the tub being disposed rearwardly of the deep section thereof, and the heating element being disposed in the shallow section of the tub and extends above the upper surface of the shallow section of the tub.

4,108,142

PORTABLE BARBEQUE

Leslie Barson, Ormond, and Frederick Charles Davis, Knoxfield, both of Australia, assignors to Companion Pty. Limited, Australia

Filed Jun. 28, 1976, Ser. No. 700,531
Int. Cl.[2] A47J *37/00*
U.S. Cl. 126—41 R **11 Claims**



1. A gas fired barbeque comprising a support structure, a hotplate detachably supported on the structure, burner means beneath the hotplate for heating the hotplate, a plurality of apertures in the hotplate spaced around the hotplate at or near its periphery, the apertures being positioned wholly around the hotplate and confined to the periphery, a receptacle beneath the hotplate, the apertures acting to drain fat and other liquids liberated during a cooking operation on the hotplate into said receptacle, clip means associated with the receptacle for removably securing the hotplate to to the receptacle whereby the receptacle can be readily separated from the hotplate for cleaning after use.

4,108,143

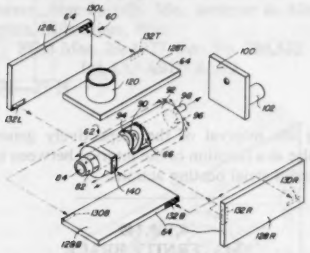
FORCED AIR HEATER BLOWER

Bradley A. Pelsue, Lakewood, and Allan E. Beavers, Littleton, both of Colo., assignors to T.A. Pelsue Company, Englewood, Colo.

Filed Apr. 20, 1977, Ser. No. 789,104
Int. Cl.[2] F24H *3/06*
U.S. Cl. 126—110 B **12 Claims**

1. A heater blower comprising: a hollow box-like housing having a first partition wall dividing the interior thereof into two separate compartments, air intake means communicating the interior of the first of said two compartments for introducing fresh air therein, a second partition wall dividing the interior of the second of said two compartments into a third and fourth compartment, fan means mounted within an opening in that portion of the first partition wall separating the first and third compartments for bringing fresh air into the latter, a third partition wall dividing the fourth compartment into a combustion air intake chamber and an exhaust chamber, openings in the housing communicating the interiors of both the combus-

tion air intake and exhaust chambers, a combustion chamber located within the third compartment opening into the fourth compartment through the second partition wall, means comprising a burner connectable to a source of fuel located within the fourth compartment in position to direct a flame into the interior of the combustion chamber, a jacket encasing the combustion chamber in heat exchange relation therearound cooperating therewith to define a heat exchanger having an inlet and an outlet sealed against the products of combustion, a serially-connected series of ducts encasing the jacketed combustion chamber so as to define an exhaust passage therebetween having an inlet connected to receive the hot gaseous



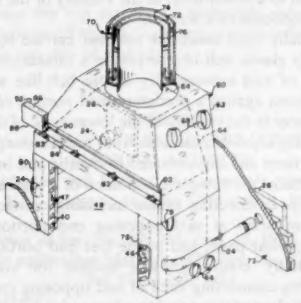
products of combustion from the combustion chamber and an outlet connected to deliver same to the exhaust chamber, said ducts having an inlet connected to receive fresh air from the fan means and an outlet connected to deliver same to the inlet of the heat exchanger, the portions of said ducts between the inlet and outlet defining a circuitous passage alongside said exhaust passage effective to preheat the fresh air preparatory to delivering same to the heat exchanger, and the interior of said heat exchanger being partitioned to define an extension of said circuitous passage alongside said exhaust passage effective to take the preheated air and further heat same in advance of discharging it from the heat exchanger outlet.

4,108,144

SUPPLEMENTAL AIR SUPPLY FOR A FIREPLACE

Murray O. Wilhoite, Huntsville, Ala., assignor to Martin Industries, Inc., Huntsville, Ala.

Filed Feb. 7, 1977, Ser. No. 766,135
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—120 **5 Claims**



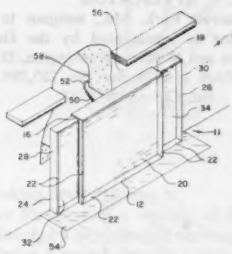
1. A fireplace comprising:
a firebox having an open front;
first and second manifolds, said manifolds being positioned on either side of said open front of said firebox;
air inlet means for introducing air into each of said manifolds;
a series of adjustably openable louvered openings on facing sides of said manifolds; and
a plurality of deflectors positioned adjacent to the louvered openings and oriented upward in the direction of air flow out of said manifolds, whereby air is directed from each of said manifolds toward an upper central region of said open front of the fireplace and then into the fireplace.

4,108,145

FIREPLACE CLOSURE

Jean M. Klomser, and Jeffrey L. Klomser, both of Rte. 7, Box 128, Chapel Hill, N.C. 27514

Filed May 4, 1977, Ser. No. 793,632
Int. Cl.[2] F24C *15/10*
U.S. Cl. 126—140 **10 Claims**



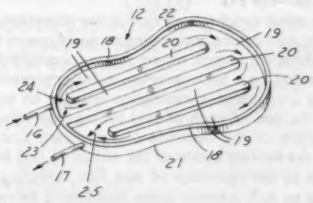
1. An adjustable fireplace closure adapted to close various size fireplace openings, said adjustable fireplace closure comprising: a central closure section including an impervious face panel and having an open area formed therein; first and second adjustable side sections operatively associated with said central closure section with each side section including an impervious face panel and movably mounted in the open area of said central closure section and movable from an inner retracted position to an outer extended position with respect to said central closure section, whereby the effective width of said fireplace closure may be adjusted by moving said first and second side sections between said inner and outer positions; and retaining means secured to said fireplace closure and extending therefrom and including means for attachment to a fireplace structure, such that said fireplace closure may be firmly retained adjacent a fireplace opening by attaching said retaining means to a portion of the adjacent fireplace structure.

4,108,146

BENDABLE THERMAL PACK UNIT

Theodore Alan Golden, 1063 Ardmore, Birmingham, Mich. 48084

Filed May 16, 1977, Ser. No. 797,029
Int. Cl.[2] A61F *7/00*
U.S. Cl. 128—400 **10 Claims**



1. A relatively thin bendable thermal pack unit adapted to be molded to conform closely to the contours of a portion of a human body and to retain the molded shape when positioned to circulate a thermal fluid to heat or cool adjacent skin areas

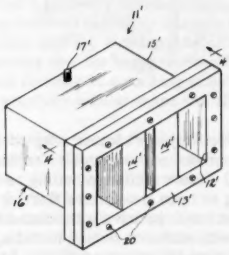
to aid in healing and the like, said thermal pack unit comprising a bendable plastic-like web having at least one channeled space formed in a surface thereof to form a fluid path for the circulation of a thermal fluid, a relatively thin sheet of non-resilient bendable material secured over said channeled surface of said plastic-like web for sealing the top of said channeled space, said relatively thin sheet being bendable to conform to a given contour and adapted to retain that contour to aid in keeping the positioned thermal pack unit in place upon a portion of a human body, and means coupled to outlets in the channeled space for circulating thermal fluid therein to heat or cool areas of the human body adjacent the non-channeled surface of said plastic-like web.

4,108,147

DIRECT CONTACT MICROWAVE DIATHERMY APPLICATOR

Gideon Kantor, Garrett Park, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,590
Int. Cl.[2] A61N *5/02*
U.S. Cl. 128—404 **10 Claims**



1. A direct contact microwave diathermy applicator comprising a waveguide defining a cavity and having an open front end and vertical walls, a pair of spaced-apart, parallel, tetrafluoroethylene dielectric loading slabs secured in said cavity of said waveguide and extending lengthwise toward said open front end, and means including a connecting terminal positioned substantially symmetrically to connect said waveguide to the output of a microwave diathermy machine, whereby wave propagation is effected in the TEM mode and substantially uniform heating can be effected.

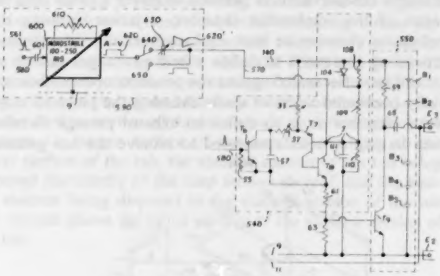
4,108,148

PACER WITH AUTOMATICALLY VARIABLE A-V INTERVAL

Robert Lee Cannon, III, Waltham, Mass., assignor to Sheldon Thaler, Princeton, N.J.

Filed Nov. 3, 1976, Ser. No. 738,418
Int. Cl.[2] A61W *1/36*
U.S. Cl. 128—419 PG **7 Claims**

1. In an atrial synchronous device for stimulating the heart of a patient, said device comprising terminal means for connection to said patient's heart, timing means for establishing timing intervals based on a basic interval, pulse generator means for generating a ventricular stimulation impulse on said terminal means at the end of each of said timing intervals to effect a beating action of the ventricle of said heart, first means for detecting the beating action of the atrium of said heart, means responsive to the operation of said first detecting means for generating an A-V interval pulse, said timing means including control means responsive to said A-V interval pulse for varying said timing interval relative to said basic interval within a predetermined range, the completion of a said varied timing interval coinciding with the completion of a respective said A-V interval pulse, and means responsive to at least said ventricular stimulation impulse for resetting said timing means, the improvement wherein said A-V interval pulse generating means comprises means responsive to successively detected beating actions of the atrium of said heart for automatically



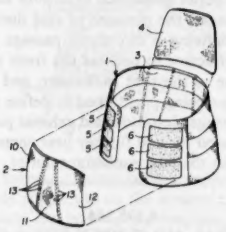
controlling the interval of the respectively generated A-V interval pulse as a function of the interval between said successively detected atrial beating actions.

4,108,149

MATERNITY BRACE

Ignatius F. Castiglia, 500 E. 77th St., New York, N.Y. 10021

Filed Jan. 6, 1977, Ser. No. 757,153
Int. Cl.[2] A41C *1/08*
U.S. Cl. 128—579 R **12 Claims**



1. An appliance for pregnant women, comprising:

a substantially elastic belt-like section having respective free end portions, said elastic section being adapted to extend across a rear body portion of a wearer, and to extend from an upper level in the vicinity of the upper part of the abdomen to a lower level in the vicinity of the lower part of the abdomen of a wearer;

a substantially rigid sheet-like member carried by said substantially elastic belt-like section in a substantially central portion of said substantially elastic belt-like section for engagement against a predetermined portion of the body of a wearer in the vicinity of the lower back of the wearer;

a completely separable inelastic front panel having opposing end portions and dimensioned to overlie and bear against substantially the complete abdomen of a wearer; and

contact-type connecting means including contact-type engagement areas at said opposing end portions of said inelastic front panel and at the free end portions of said substantially elastic belt-like section for continuously adjustably connecting each of said opposing end portions of said inelastic front panel to a respective free end portion of said substantially elastic belt-like section at a continuously variable plurality of positions relative to said free end portions with said end portions of said inelastic front panel always in overlying contact with their respective free end portion of said substantially elastic belt-like section to substantially prevent horizontal and vertical relative movement therebetween at the contact areas so that

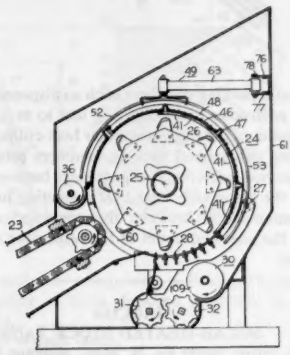
said inelastic front panel is substantially symmetrically locatable relative to said substantially elastic belt-like section at a plurality of orientations with said inelastic front panel overlying and elastically biased against substantially the complete abdominal area of the body of a wearer and so that said appliance is continuously adjustable to different sizes and different orientations of said front panel to accommodate growth of the abdominal area of a pregnant woman.

4,108,150

AGITATOR FOR AN AXIAL FLOW CYLINDER

J. Lyle Shaver, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 23, 1977, Ser. No. 780,532
Int. Cl.[2] A01D *41/12*
U.S. Cl. 130—27 H **8 Claims**



1. In a combine the combination comprising:
a frame;
a horizontally disposed threshing cylinder mounted on said frame for rotation about an axis,
a cylindrical cage secured to said frame in surrounding relation to said threshing cylinder having radial openings circumferentially thereabout permitting egress of threshed material,
means causing axial flow of material from one axial end of said cage to the other as said threshing cylinder is rotated, and
an agitator mechanism including spaced mechanical fingers adjacent the top exterior of said cage and drive means oscillating said fingers to disturb accumulation of material on the top side of said cage.

4,108,151

GAMMA ALUMINA FILLED PAPER WRAPPER FOR SMOKING ARTICLES

R. Hugo Martin, and William F. Owens, Jr., both of Pisgah Forest, N.C., assignors to Olin Corporation, Pisgah Forest, N.C.

Continuation of Ser. No. 639,293, Dec. 10, 1975, abandoned. This application Mar. 10, 1977, Ser. No. 776,183
Int. Cl.[2] A24D *1/02*
U.S. Cl. 131—9 **4 Claims**

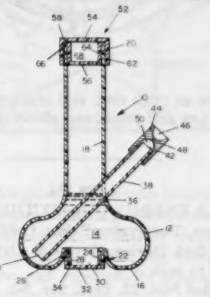
1. A combustible cigarette paper that is effective in selectively reducing the vapor phase constituents in tobacco smoke, comprising cellulose fibers and a gamma alumina filler, substantially free of other crystalline forms of alumina said cigarette paper containing from 50 to 80% of said gamma alumina filler based on the weight of the filled paper, said gamma alumina filler pulverized to pass through a 300-mesh screen.

4,108,152

STORAGE COMPARTMENT CAP FOR LIQUID-FILTERED SMOKING DEVICE

Richard W. Kahler, Rte. 1, Box 61, Rock Cave, W. Va. 26234

Continuation-in-part of Ser. No. 699,372, Jun. 24, 1976, which is a continuation-in-part of Ser. No. 509,941, Sep. 27, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,270
Int. Cl.[2] A24B *5/04, 5/08;* A24F *1/02, 1/30*
U.S. Cl. 131—173 **5 Claims**



1. In a smoking device having
a container for housing a volume of fluid and including means defining a first opening therein;
means defining a second opening within said container;
tubular means open at both ends thereof, inserted through said second opening means such that one end of said tubular means is immersed within said volume of fluid while the other end thereof projects outwardly of said container;
smoking bowl means, for housing a predetermined volume of tobacco, mounted upon said other end of said tubular means and fluidically connected to said tubular means,
the improvement comprising a cap means removably mounted upon said container so as to cover and seal said first opening, said cap comprising:
a first cup member having a substantially inverted U-shaped configuration;
a second cup member having a substantially U-shaped configuration, disposed interiorly of said first cup member, said cup members defining said storage compartment therebetween;
said second cup member having a flange formed about the upper, external periphery thereof; and
said flange being in contact with the interior wall of said first cup member so as to separate the outer peripheral wall of said second member from the interior wall of said first member and thereby define an annular space therebetween for accommodating said container means defining said first opening.

4,108,153

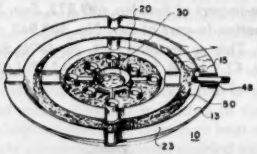
QUICK EXTINGUISHING ASH TRAY

Edward K. Pearson, Cold Spring Harbor, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,426
Int. Cl.[2] A24F *13/18, 19/14*
U.S. Cl. 131—235 R **4 Claims**

1. An ash tray formed of
an outer circular tray
an inner circular tray and
a bracket fitted inside the inner circular tray, in which
the inner tray rests on the base of the outer tray, being positioned in place by upraised detent means on said base, said detent means located to provide an annular recess between the external walls of the inner and outer tray, with

said bracket formed of a central open ring member joined to outward radially projecting spokes, with each spoke terminating in an open ring, said bracket fixed to the side of the inner tray and positioned above the base of said inner tray.

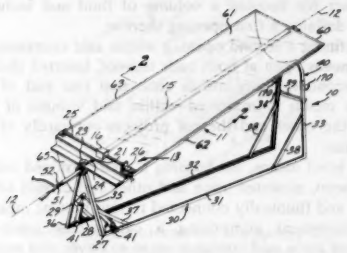


4,108,154

SOLAR ENERGY COLLECTION SYSTEM

David H. Nelson, Twentynine Palms, Calif., assignor to Homer Van Dyke; Mark Dorian; Dave Van Dyke and George Lerg, part interest to each

Filed Nov. 22, 1976, Ser. No. 744,290
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **31 Claims**



1. In a solar energy collection mechanism in which a solar collector or a reflector trough is mounted upon a support to rotate about an axis under the control of a drive mechanism, thereby varying the elevation of the center of gravity of said collector or trough, to maintain reflected rays of the sun in focus on a solar energy collection means, the improvement comprising a transverse guide, "a counterweight mounted on said collector or trough and laterally movable along said transverse guide relative to said collector or trough to maintain said collector or trough in stabilized" gravitational equilibrium, and damping means connected between said solar collector or said reflector trough and said support to inhibit spurious rotation of said mechanism.

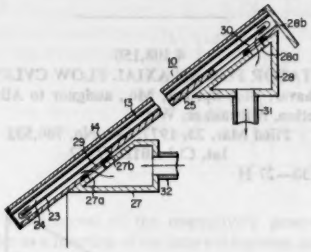
4,108,155

HOT AIR TYPE SOLAR HEAT-COLLECTING APPARATUS

Hisao Koizumi, Zushi; Yoshinosuke Kawada, Yokohama, and Sadao Fujimura, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd. and Toshiba House Living Industry Co., Ltd., both of Tokyo, Japan

Filed Dec. 23, 1976, Ser. No. 753,825
Claims priority, application Japan, Dec. 26, 1975, 50-158589
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 **12 Claims**

1. A hot air type solar heat-collecting apparatus which comprises a base; a pair of parallel-extending plenum ducts which are supported on the base and lie on the same inclined plane of the roofing of a dwelling and whose upper walls are respectively provided with a plurality of openings formed at predetermined intervals along the lengthwise direction of said plenum ducts; at least one solar heating-collecting unit which extends over the upper walls of both plenum ducts and is provided with an inlet and outlet facing the respective openings of the plenum ducts; and packing means provided between the upper walls of both plenum ducts on one hand and the inlet and outlet of the respective solar heat-collecting unit on the other wherein said packing means has first elastic packing members each so disposed on the upper wall of each of the plenum ducts as to surround the openings of each duct and



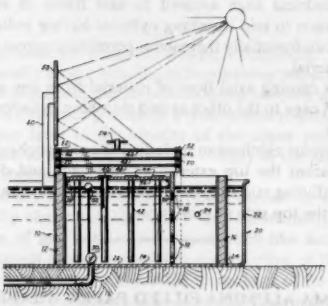
second elastic packing members each so disposed on the lower surface of each solar heat-collecting unit so as to surround the inlet and outlet of the respective solar heat-collecting units, the first packing and second packing members being engaged to thereby provide a frictional engagement between the plenum ducts and the respective solar heat-collecting unit and an airtight communication between the openings of the plenum ducts and the inlet and outlet of the respective solar heat-collecting unit.

4,108,156

SOLAR-HEATED STOCK TANK

Spencer B. Sitter, Santa Fe, N. Mex., assignor to Jay Taylor, Amarillo, Tex.

Filed Mar. 2, 1977, Ser. No. 773,486
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 **36 Claims**



1. In a water tank for livestock having
a. a tank body with
(i) a tank floor and
(ii) at least one insulated tank wall,
b. said tank body enclosing a tank volume,
c. water within said tank body,
The method of maintaining a stock tank free of ice comprising in combination with the above:
d. permitting sunlight to shine through a transparent covering, thereby
e. heating the volume of air and water beneath said transparent covering, and
f. retaining the heat energy within said volume by trapping

said air beneath said transparent covering within said tank volume, thereby

g. producing a "hothouse" effect within said tank volume, thereby

h. heating said water to a temperature above that at which water freezes,

j. conducting water from the tank body to a drinking vessel for livestock to drink from, and

k. heating the water in the drinking vessel by convection heating from the tank body.

4,108,157

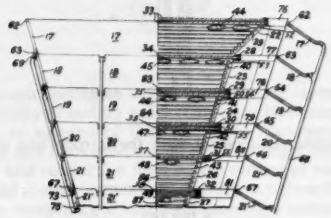
SOLAR ENERGY COLLECTOR

Jerry Gorniak, 2317 E. 43rd St., Erie, Pa. 16510

Continuation-in-part of Ser. No. 577,259, Jul. 13, 1975, Pat. No. 4,029,077. This application Mar. 18, 1977, Ser. No. 779,079

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **3 Claims**



1. A solar collector comprising a fluid path for a liquid having a plurality of turns disposed generally in a hollow pyramidal body,

a plurality of storage tanks,

a plurality of first lenses,

a first sheet means supporting said lenses,

said first lenses having spaced from them a first fluid path for liquid,

said first fluid path for liquid being disposed a distance from said lenses a distance substantially equal to the focal length of said first lenses,

means to conduct said liquid from said fluid path to a heat battery,

said fluid path comprising a first coil of tubing,

a second sheet of rigid material disposed generally parallel to said first sheet,

and a third sheet of rigid material spaced from said second sheet generally parallel to said first sheet of material supporting a sheet of water,

a plurality of second lenses fixed to said second sheet of material to the underside thereof,

and second lenses being spaced from said sheet of water a distance substantially equal to the focal length of said second lenses,

a plurality of louvers,

hinge means swingably supporting said louvers on said body,

and means for opening and closing said louvers.

4,108,158

SOLAR ENERGY POWERED HEAT GENERATOR

Aloysius C. Kracklauer, Conroe, Tex., assignor to Sparkler Filters, Inc., Conroe, Tex.

Filed Mar. 28, 1977, Ser. No. 781,982

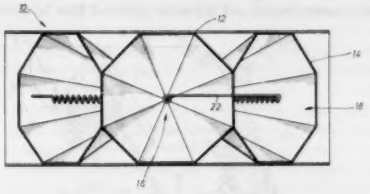
Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **3 Claims**

1. A solar energy powered heat generator comprising:

(a) a housing;

(b) a plurality of continuously disposed, conical shaped collecting structures supported within said housing, each of said collecting structures defined by a plurality of triangular-shaped glass mirrors interconnected in a single row in a configuration to provide a common junction of the respective corners of the mirrors and to provide an open face directed for receiving solar energy, the open face being defined by respective sides of the mirrors and the common junction being defined by the corners of the mirrors opposite the respective faces; and



(c) a plurality of elongated heat transfer structures supported within the respecting collecting structures, said heat transfer structures including a plurality of serially connected, segments of coiled tubing extending radially from said common junction and substantially centrally within the respective collecting structure.

4,108,159

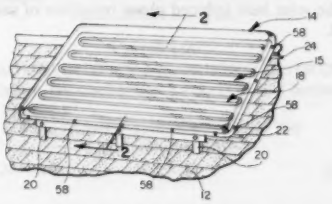
SOLAR COLLECTOR

Ion L. Wendel, St. Petersburg, Fla., assignor to James L. Lowe, St. Petersburg, Fla.

Continuation-in-part of Ser. No. 596,513, Jul. 16, 1975, abandoned. This application May 16, 1977, Ser. No. 797,468

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **21 Claims**



1. A heat pan and tube type solar collector comprising, a heat plate of self-supporting, substantially rigid material having an upper face and peripheral edge portions substantially coplanar with said face, tube means extending along and fixed to said face in heat transfer relationship therewith for circulation through said tube means of a fluid to be heated; and a solar energy transmitting cover having a top spaced from and extending across said face and said tube means and having side means depending from said top to said peripheral edge portions of the plate for passage of solar energy through said top and side means of the cover to the heat plate and tube means, and means fixing said cover directly to said heat plate.

4,108,160

SOLAR WATER HEATING APPARATUS

William Anthony Harper, 7727 Baseline Rd., Boulder, Colo. 80303

Filed Jun. 21, 1977, Ser. No. 808,716

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **6 Claims**

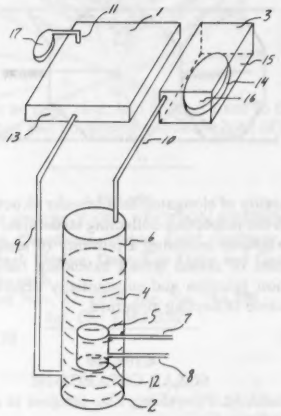
1. Apparatus for transducing solar energy into direct pressurized fluid control and transfer of a heat absorbent transport medium used in a domestic hot water system, comprising:

a substantially inflexible fluid-tight solar heat collector of predetermined dimensions;

a first fluid volumetrically confined in said collector, said first fluid having a phase transition temperature beyond the predetermined range developed by said collector;

means providing for the pressurized transfer of a predetermined portion of said first fluid beyond said collector;

a second fluid volumetrically confined within said collector, said second fluid having a predetermined vaporization



phase transition temperature point within the predetermined range developed by said collector; and,

means of transporting a heat absorbent medium between a heat exchange means and a solar heat collecting means which respones to said pressurized first fluid as developed by the solar heat induced phase transition of said second fluid.

4,108,161

GRAFT FORMING DEVICE

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest C. Wood, 2461 Ivanhoe Dr., Los Angeles, Calif. 90039

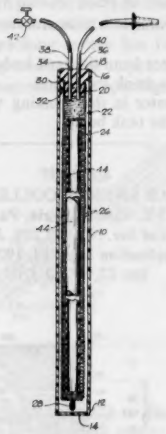
Continuation-in-part of Ser. No. 626,070, Oct. 28, 1975. This application Nov. 8, 1976, Ser. No. 739,650

The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.

Int. Cl.[2] A61B *19/02*

U.S. Cl. 128—1 R **10 Claims**

1. A device for use in the preparation of a graft for blood vessels comprising a hollow tubular member formed of a fluid impervious material and open at one end, a removable closure adapted to engage the open end of the tubular member in sealing relation, an elongate flexible porous base member suspended from the closure into the hollow tubular member, said porous base member being dimensioned in the crosswise direction to be less than that of the hollow tubular member to provide a spaced relation between the porous base member and the inner wall of the tubular member, said porous base member having axially spaced corrugations to enable the base member to be stretched in the axial direction and bendable in all of the directions without collapse, a passage through said removable closure for insertion of a member connecting the interior of the hollow tubular member with a source of blood, and another sealable passage communicating with the interior of the hollow tubular member for the removal of gases from within the



tubular member co-incident with the introduction of blood therein.

4,108,162

TWISTED WIRE BRUSH WITH THREADED ASSEMBLY FOR COLLECTING CELLS

Kiyoshi Chikashige, 946-2, Otagaya, Tsurugashima-machi, Iruma-gun, Saitama, and Teruo Ohuchi, No. 13-10, Kamifukuoka 4-chome, Kamifukuoka-shi, Saitama, both of Japan

Filed Dec. 21, 1976, Ser. No. 753,073

Claims priority, application Japan, Dec. 28, 1975, 50-158463

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—2 B **7 Claims**

1. A brush for collecting cells for examination, comprising; a twisted wire root portion having hairy materials extending radially outwardly from an end portion thereof, said materials being held between two twisted wires of said root portion; and an elongated flexible wire winding having a tip portion threadingly engaging said twisted wire root portion, the pitch of said tip portion being greater than the pitch of a remaining portion of said winding such that the lay of said wire root portion matches the pitch of said tip portion.

4,108,163

PUNCTURE PROBE FOR MEASURING HEAT TRANSFER OR BLOOD CIRCULATION OF LIVING TISSUES

Wolfgang Fleckenstein, and Volker Thiemann, both of Kiel, Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Germany

Filed Nov. 4, 1976, Ser. No. 738,826

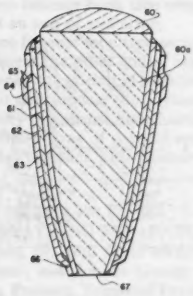
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549559

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 H **11 Claims**

1. A puncture probe for measuring heat transfer or blood circulation of living tissues, particularly in man, comprising a

probe support having a tip, first and second oppositely connected thermocouples each formed of an outwardly extending layer of a thermoelectric material and of a common connecting layer of a different thermoelectric material, one of said thermocouples being heated and arranged in the range of said probe tip, the other of said thermocouples being unheated and arranged at a spaced location on said probe support, said first



thermocouple having an outwardly extending layer arranged in the vicinity of said tip and a connecting layer comprising a plurality of superposed thin conductor films separated by insulating thin films except in an area forming a contact zone between said conductive films on the surface of said support probe, said second thermocouple having an outwardly extending layer comprising a thin conductive film contacting said connecting layer.

4,108,164

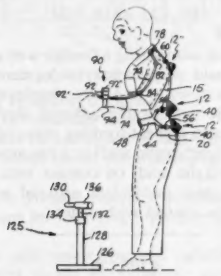
STANDARD BENDING PROFILE JACKET

Henry W. Hall, Sr., 941 Avon Rd., West Palm Beach, Fla. 33401

Filed Oct. 1, 1976, Ser. No. 728,632

Int. Cl.[2] A61B *5/10*

U.S. Cl. 128—25 **26 Claims**



17. The apparatus as set forth in claim 16, wherein said supporting means further comprises a third elastic strap which traverses the thoracic portion of the spine, a third potentiometer means being connected thereto.

4,108,165

TRANSDUCER PROBE FOR PULSE-ECHO ULTRASONIC EXPLORATION

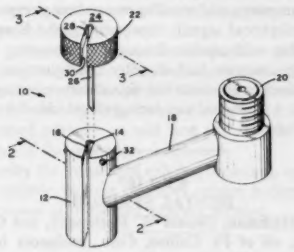
Edward L. Kopp, Centre Hall; Paul A. Meyer, and James N. Sabol, both of Lewistown, all of Pa., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Jun. 20, 1977, Ser. No. 808,066

Int. Cl.[2] A61B *5/10*

U.S. Cl. 128—2 V **10 Claims**

1. A transducer probe for pulse-echo ultrasonic exploration of a biological body comprising in combination a housing, a piezoelectric wafer disposed in said housing and adapted to be acoustically coupled to said body, electrical connections coupled to said wafer for applying electrical pulse signals to said wafer and providing electrical signals responsive to acoustic echo signals received by said wafer, a backing layer contacting one side of said wafer for damping acoustic energy received by said wafer, a bore disposed substantially centrally through the thickness of said wafer and extending through said backing layer and housing, and a radial slot extending from said bore to the periphery of said housing wherein the improvement comprises:



cap means having a depending stem adapted to extend into said bore coupled to said housing for rotation with respect to said housing; said cap means and stem having aligned radial slots for providing when said cap means is rotated on said housing to cause the slot of said cap means and of said stem to be out of registry with respect to the slot in said housing a bore which encircles a surgical instrument inserted into the bore, and for providing when said respective slots are in registry a radial slot for removing said transducer probe in a lateral direction from around said instrument.

4,108,166

CARDIAC FREQUENCY MEASURING INSTRUMENT

Walter Schmid, Bahnhofstrasse 7 - 9, D 8870 Günzburg, Fed. Rep. of Germany

Filed May 19, 1976, Ser. No. 687,708

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.06 F **14 Claims**

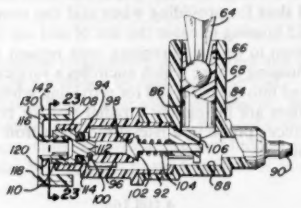
1. A cardiac frequency measuring instrument including a minaturized digital circuit frequency measuring device adapted to be carried on the arm of a patient, measuring electrodes adapted to be attached to the body of the patient for generating an electrical signal in response to the heart beat frequency of the patient, a cable for carrying electrical signals generated by said electrodes connecting the frequency measuring device with said measuring electrodes carried on the body, an optical display electrically coupled to said frequency measuring device for visually displaying the frequency measured by said frequency measuring device and corresponding to the heart beat frequency of the patient, and a housing means having the size of a wrist watch for containing said frequency

measuring device and said optical display, said cardiac frequency measuring instrument requiring relatively low electrical power consumption for digital measurement and display of the cardiac frequency, said frequency measuring device including a resonant amplifier, connected as a high pass filter, for automatically suppressing the amplification and display of motional artifacts, thereby reducing error between the displayed heart beat frequency and the actual heart beat frequency; said cardiac frequency measuring instrument including a standby means for assuming a standby configuration having a power consumption only a fraction of the normal power consumption, said standby means being responsive to an absence of electrical signals representing the heart beat frequency so that said cardiac frequency measuring instrument automatically assumes said standby configuration whenever there is an absence of electrical signals representing the heart beat frequency from said measuring electrodes for a predetermined time interval.

4,108,167
DENTAL SYRINGE

Clarence J. Hickman; Donald W. Ruehmann, and Christopher W. Elkins, all of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Jan. 31, 1977, Ser. No. 764,280
Int. Cl.[2] A61H *9/00*
U.S. Cl. 128—66 **12 Claims**



2. In a device which includes a supply of liquid, a pump for propelling said liquid, means for delivering the propelled liquid to a point of use and a control for adjusting the pressure of the delivered liquid, the improvement comprising:

said control including a passage through which said liquid is propelled by action of said pump, a bypass for said passage and a valve for adjustably throttling the amount of said liquid conducted in said bypass;

said valve including a rotatable stem carried within a sleeve having means defining a pair of stops circumferentially displaced around the axis of said sleeve, and said stem having a cylindrical surface concentric with said axis;

a control knob having a pair of radial abutments respectively cooperative with said stops to limit rotation of said knob around said axis between corresponding positions of high and low pressure of the propelled liquid outletting said pump;

said knob also including a tube engageable concentrically with said cylindrical surface and fixedly secured thereto during assembly when one of said stops is engaged with one of said abutments while said stem is at one limit of rotation.

4,108,168
HIP SPLINT DEVICE

William A. Craig, 326 Viewcrest Rd., Glendale, Calif. 91202

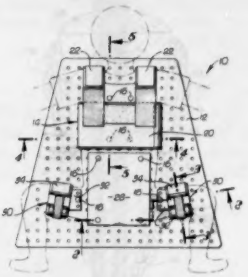
Filed Feb. 10, 1977, Ser. No. 767,350
Int. Cl.[2] A61F *3/00*
U.S. Cl. 128—80 A **9 Claims**

1. A hip splint device for maintaining hip flexion above 90° in the treatment of congenital hip conditions in small children comprising:

a planar support member;

adjustable shoulder harness means removably mounted on the upper portion of said back support member;

a pair of spaced thigh cuff anchoring members mounted on said back support member below said shoulder harness means, each of said thigh cuff anchoring members including a loop member; and



a pair of thigh cuff members each pivotally mounted to each of said loop members of said thigh cuff anchoring members and having fastening means, said thigh cuff members being adapted to maintain hip flexion of a child's hips above 90°.

4,108,169
HARDENABLE SHEET MATERIALS FOR SURGICAL SPLINTS

Robert Sydney Richard Parker, Little Hallingbury, near Bishop's Stortford, England, assignor to National Research Development Corporation, England

Division of Ser. No. 525,731, Nov. 21, 1974, abandoned. This application Jun. 25, 1976, Ser. No. 701,608
Claims priority, application United Kingdom, Nov. 29, 1973, 55471/73
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—89 R **57 Claims**

1. A surgical splint comprising a flexible web and a poly(carboxylate)cement, said poly(carboxylate)cement having been formed by addition of water to a water-hardenable sheet comprising said flexible web having adhered thereto a cement-forming material, said cement-forming material comprising a water-soluble poly(carboxylic acid) or a precursor thereof that forms a poly(carboxylic acid) on contact with water and an ion-leachable inorganic particulate material which together form a cement upon contact with water.

4,108,170
PATIENT SUPPORT STRAP

Donald C. Spann, 5 Fernwood Ct., Greenville, S.C. 29607

Filed Mar. 24, 1977, Ser. No. 780,762
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—134 **1 Claim**

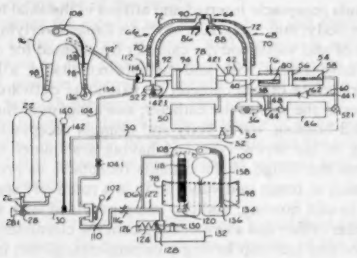
1. A support strap as for a seated patient to prevent slumping of the patient as when losing consciousness consisting essentially of:

an elongated strap constructed of synthetic foam material;
said strap being of substantially rectangular cross-section and having opposed faces of a width on the order of about three inches and opposed edges of a thickness on the order of about one inch;
the length of said strap being sufficient to pass about a chair and the girth of the patient;
a length of Velcro fastener hook tape secured on one of said faces adjacent an end of said strap;
a length of Velcro fastener loop tape secured on the other of said faces adjacent the other end of said strap; and
said Velcro fastener tapes being of sufficient length to afford adjustability to said support strap when joined to accommodate a variety of patients and chairs;
whereby an extensive area of support contact with the patient is provided together with limited yieldability.

4,108,171
BREATHING APPARATUS

Roland John Nyman, 59, 16th St., Parkhurst, Johannesburg, Transvaal Province, and Johann George van der Walt, 74 Rose St., Riviera, Pretoria, Transvaal Province, both of South Africa

Filed Jun. 9, 1976, Ser. No. 694,451
Claims priority, application South Africa, Jun. 11, 1975, 75/3762
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—142.2 **12 Claims**

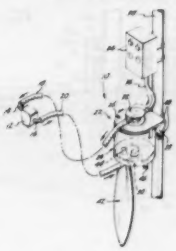


1. Breathing apparatus comprising:
(a) a source of breathing mixture;
(b) inlet means for inhalation of said breathing mixture to a user and outlet means for recovering exhalation from a user;
(c) a variable volume chamber communicating with said outlet means for receiving a portion of said each exhalation;
(d) first flow path means from said variable volume chamber to said inlet means for returning said portion of each exhalation to said inlet means for rebreathing;
(e) means for discharging from the apparatus the remainder of each exhalation;
(f) normally closed valve means of the demand type having an outlet communicating with said inlet means and an inlet and including means responsive to pressure at said inlet means for opening said valve upon the user of the apparatus inhaling;
(g) a first reservoir;
(h) a second reservoir having an inlet and an outlet;
(i) second flow path means connecting said source of breathing mixture with said first reservoir and said inlet of said second reservoir;
(j) valve means in said second flow path means for providing flow of said breathing mixture from said source to said first and second reservoirs only during exhalation by the user;
(k) non-return valve means in said second flow path means adjacent said inlet of said second reservoir preventing flow therefrom;
(l) third flow path means connecting said outlet of said second reservoir with said first reservoir and said inlet of said normally closed valve means and including further non-return valve means between said first and second reservoirs permitting flow from said second reservoir towards said first reservoir;
(m) further normally closed valve means in said third flow path means between said outlet of said second reservoir and said further non-return valve means and arranged to be opened by said means responsive to said pressure at said inlet means upon the user of the apparatus inhaling;
(n) pressure detecting means for sensing pressure in said first and second reservoirs; and
(o) stop means including means responsive to said pressure detecting means for limiting the maximum volume to which said variable volume chamber can expand during exhalation in dependence on the detected magnitude of the sensed pressure in said first and second reservoirs at the end of the preceding inhalation;
(p) whereby the volume of exhaled breathing mixture which said variable volume chamber retains is dependent upon the volume of breathing mixture inhaled.

4,108,172
CARBON DIOXIDE ABSORPTION CANISTER FOR USE WITH ANALGESIA EQUIPMENT

George B. Moore, Jr., 23203 56th W., Mountlake Terrace, Wash. 98043

Continuation of Ser. No. 616,857, Sep. 25, 1975, abandoned. This application Jun. 14, 1977, Ser. No. 806,446
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—188 **14 Claims**



1. In an apparatus for administering a gaseous anesthetic to a patient including a gas supply machine for metering selected amounts of anesthetic gas, a mask for supplying said gas to a patient, said mask having an inlet and an outlet, an inhalation conduit coupled to the inlet of said mask and operatively coupled to receive gas from said gas machine, and an exhalation conduit coupled to the outlet of said mask, an improved carbon dioxide absorption canister operatively coupled to said inhalation and exhalation conduits comprising:
a container having a side wall, a bottom wall, and an open top, said side wall and said bottom wall defining a cavity therein for holding medium to absorb carbon dioxide from gas present within said cavity, said side wall and said bottom wall of said container being composed of a transparent, resinous material, said bottom wall having a well therein extending downwardly from the inside surface of said bottom wall outwardly toward the outside surface of said bottom wall and terminating short thereof, said bottom wall further including a bore communicating between said well and the exterior of said bottom wall,
a first check valve having an annular body positioned in said well and extending upwardly from the inside surface of said bottom wall, said first check valve including means for admitting gas into said cavity through said bore and for preventing gas from escaping from said bore, said check valve being constructed so that the operation

thereof can be visually monitored through the walls of said container,

first fitting means associated with the bore on the bottom of the container for operatively coupling said exhalation conduit to the bore on the bottom of said container,

a lid for covering the open top of said container, said lid having an outlet therein,

means for securing said lid to said container,

means associated with said lid and said container for forming a fluid-tight seal therebetween when said lid is covering the open top of said container,

a second check valve positioned in the outlet in said lid, said second check valve including means for allowing gas to escape from said cavity through said outlet and for preventing gas from entering said outlet, said container, said lid and said first and second check valves cooperating to define a unidirectional fluid path from said first fitting means, through said cavity, and to said outlet, and,

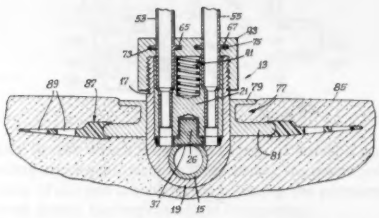
second fitting means associated with the outlet on said lid for operatively coupling said outlet to said inhalation conduit and to said gas machine.

4,108,173

BLOOD ACCESS DEVICE

Victor Slivenko, San Diego, and Michael R. Emken, Encinitas, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Apr. 11, 1977, Ser. No. 786,499
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 R **9 Claims**



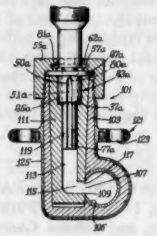
1. A device to provide access to the circulatory system of a living body for simultaneous withdrawal from and return of blood to the system comprising a tubular conduit of generally circular cross section insertable in a living blood vessel; a generally cylindrical housing having one closed end and extending transversely of and adjoining said conduit at the closed end, the point of adjoining being centered with respect to the closed end of said housing such that the axes of the conduit and the housing form a right angle between them and intersect one another, the wall of said conduit intersecting said housing at said point of adjoining and said housing having a length sufficient to extend from the blood vessel to a point outside the living body; an aperture in the conduit wall at the point of intersection of said conduit with said housing to provide fluid communication between the two; a valve body in said housing, said valve body having therethrough a pair of spaced apart longitudinal passages located to be alignable with said aperture at a given rotative position of said valve body, said valve body being adapted to receive a catheter tip in each of said longitudinal passages and in fluid communication therewith, and said valve body being coaxially rotatable in said housing between positions of alignment and nonalignment of said passages and said aperture to selectively establish fluid communication between the circulatory system and the catheters when inserted in said valve body; and means for forming a seal around said aperture, the seal being maintained in all rotative positions of said valve body.

4,108,174

CATHETER INTERLOCK SYSTEM

Victor Slivenko, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 764,207, Jan. 31, 1977. This application Apr. 13, 1977, Ser. No. 787,077
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 R **5 Claims**



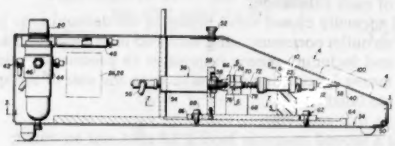
1. A catheter interlock system comprising a blood access device having at least one conduit adapted for insertion in the circulatory system of a living body; a housing having an open end, the interior of said housing being in fluid communication with the conduit; a coaxially rotatable valve body in said housing, said valve body having an axial bore in its outer end; a cannula receptacle inserted and affixed in the axial bore of said valve body, said receptacle having a flange overlying the outer ends of said valve body; a catheter tip adapted for insertion in and engagement with said cannula receptacle; a lug on the outer surface of said catheter tip extending outwardly at right angles to the axis of the catheter; and a cap over the open end of said housing, valve body and cannula receptacle, said cap being of the screw type and having a shoulder for bearing against the flange of the cannula receptacle to provide compression to retain said valve body in a rotatively seated condition in said housing, said cap being provided with a generally circular orifice and a key slot adjacent the circumference of the orifice and said cap having a circumferential slot in the inner wall thereof adjoining said key slot, said key slot serving as a passageway for said lug to enter said circumferential slot and said lug securing the position of the catheter after insertion thereof in said cannula receptacle and after rotation of the catheter to engage the lug in said circumferential slot.

4,108,175

CATHETER INSERTION APPARATUS

Dale W. Orton, 9716 Laurel St., Omaha, Nebr. 68134

Filed Jan. 28, 1977, Ser. No. 763,706
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214.4 **10 Claims**



1. Catheter insertion apparatus comprising, in combination:

an elongated hollow needle for insertion into a catheter and, with the catheter, into a vein;

a nose portion adjacent the needle for insertion into a catheter and against a flaring portion of the catheter;

chamber means, including

a first chamber adjacent the nose portion and communicating with the needle to receive a flow of blood from the needle;

a second chamber adjacent to and communicating with

the first chamber and movable relative to the first chamber to provide a partial vacuum in the first chamber to enhance the flow of blood through the needle into the first chamber; and

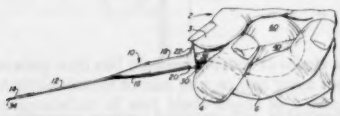
valve means located in said chamber means for providing a one-way flow of blood into the first chamber and a one-way flow of air out of the second chamber.

4,108,176

AUTOMATIC INJECTING APPARATUS

Carl W. Walden, Ulysses, N.Y., assignor to Agri-Bio Corporation, Jacksonville, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,364
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 A **39 Claims**



1. In an automatic injection device comprising:

(a) a work plate on which an animal to be injected can be positioned, said work plate having an aperture therein;

(b) a syringe mounted on the opposite side of said work plate from the side on which the animal to be injected is positioned during use of the device;

(c) first means for moving said syringe back and forth between a first position wherein said syringe is entirely withdrawn on said opposite side of said work plate and a second position wherein the needle of said syringe protrudes through the aperture in said work plate; and

(d) second means for detecting the presence of an animal to be injected in position on said work plate and for activating said first means, the improvement wherein said first means comprises:

(e) a fluid motor;

(f) third means for filtering the fluid input to said fluid motor;

(g) fourth means for controlling the pressure of the fluid input to said fluid motor; and

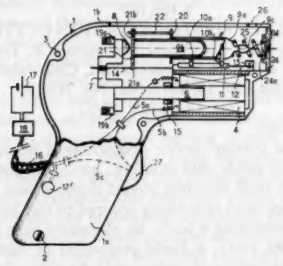
(h) fifth means for venting an accidental increase in the pressure of the fluid input to said fourth means.

4,108,177

AUTOMATIC INJECTOR DEVICE

Michel Louis Paul Pistor, 87, Boulevard Suchet, Paris, France (75016)

Filed Apr. 13, 1977, Ser. No. 787,142
Claims priority, application France, Apr. 23, 1976, 76 12126
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 A **12 Claims**



1. An automatic injector device comprising:

a frame;

a removable injection syringe comprising a syringe body, a syringe piston and at least one injection needle;

a syringe cradle carrying said syringe body and forming therewith a syringe-cradle assembly which is slidably mounted with respect to said frame by means of guiding means;

drive means coupled to said syringe-cradle assembly for actuating said syringe-cradle assembly in reciprocating motion between a retracted rear position which is a non-operative position of said injector device and an operative front position corresponding to the injection position, and for actuating said syringe piston with respect to said syringe body;

stop means located on said frame and delimiting said front position of said syringe-cradle assembly;

said drive means including an electromagnet actuating a magnetic core connected to a movable member bearing upon said syringe piston, said drive means driving said syringe piston simultaneously with said syringe-cradle assembly in rectilinear displacement towards its front position and then only driving said syringe piston when said syringe-cradle assembly reaches its front position, said drive means further including resilient means for resiliently returning said syringe-cradle assembly to its retracted rear position; and

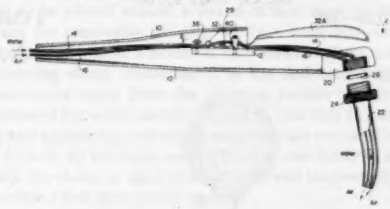
control means for selectively energizing said electromagnet.

4,108,178

PINCH VALVE SYRINGE

Frank A. Betush, Santa Monica, Calif., assignor to Progessive Machine Products, Inc., Los Angeles, Calif.

Filed Apr. 28, 1977, Ser. No. 791,735
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—224 **9 Claims**



1. A unit for controlling the flow of a fluid including: a base; an elongated resilient strip having a first bend therein adjacent a first end thereof and extending toward said base and having a second bend therein extending away from said base; an arm mounted on said base in a position displaced from the base and extending across said second bend in said strip, said second bend being normally biased by said strip towards said arm; a flexible tube extending between the base and the first bend in said strip to be pinched thereby and further extending between the arm and the second bend to be further pinched thereby; means attaching said first end of said strip to said base to establish the amount of pinching of the tube by said first bend so as to establish the rate of flow of fluid through the tube; and means at the other end of said strip to move the strip toward the base and away from the arm so as to release the tube from the pinching effect of said second bend and said arm.

4,108,179

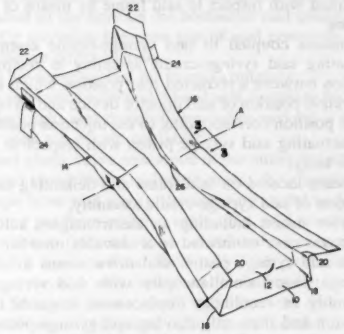
DISPOSABLE DIAPER

Charles Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 13, 1973, Ser. No. 396,835
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 **16 Claims**

1. A disposable diaper comprising a flexible, waterproof

back sheet and an overlying absorbent pad, the diaper having a series of longitudinal folds forming said back sheet and pad into a box pleat configuration which includes a pair of outwardly directed flaps, each flap defined by an outermost longitudinal fold and the adjacent diaper lateral edge, each said flap being longitudinally foreshortened.

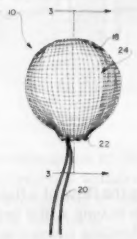


4,108,180

REUSABLE TAMPON

Doris B. Moehrle, P.O. Box 261, Southbridge, Mass. 01550

Filed Dec. 20, 1976, Ser. No. 752,602
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—285 8 Claims



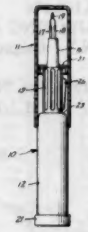
1. A reusable tampon device comprising a body of nontoxic, flexible, dry compressible menses absorptive material adapted for constrictive movement past the vaginal opening and for expanded conformation with wall portions of the vagina upstream of said opening, said body completely enveloped in an outer porous structure adapted to lie essentially flat in open relaxed disposition and forming a bag therefor and having at least one open mesh fibrous material layer, said bag in turn having an opening for receipt of said body and a draw string alternatively passing over, under and through said open mesh material along peripheral portions thereof to form said bag and for closing said opening so as to completely encompass said body therein and for opening said bag to permit removal of said body therefrom after use, said draw string adapted for outward extension from said bag and through said vaginal opening to form means for withdrawing said device from the vagina after passage of menses through said bag and absorption by said body when said device is in use and for at least partial circumferential envelopment of said body to compress the same when said device is not in use.

4,108,181

CAUTERY DEVICE FOR OPHTHALMIC OR THE LIKE SURGICAL APPLICATION

George P. Sallaris, Worthington, Ohio, assignor to Unicare Systems, Inc., Columbus, Ohio

Filed Jan. 28, 1977, Ser. No. 763,580
Int. Cl.[2] A61B *17/38*
U.S. Cl. 128—303.1 12 Claims



1. A disposable, self-contained cautery comprising an elongate tubular housing defining a battery-holder cavity at a base end and a reduced cavity at a finger-grip end which forwardly projects for said base end, said reduced cavity being of lesser diametral proportions than said battery-holder cavity and the end of said battery-holder cavity opposite said finger-grip end being closed, there being an interior generally radial shoulder formation in the inner surface of said housing at the juncture of said base and finger-grip ends, first and second spaced electrodes carried at a forward end of said finger-grip end opposite said base end and projecting longitudinally beyond said forward end, a heater-wire tip connecting the forwardly projecting ends of said electrodes and projecting forwardly thereof, one of said electrodes extending a first distance within said housing to the battery-holder cavity for contact with the forward terminal of an inserted battery, the other of said electrodes extending within said finger-grip end and for a distance less than said first distance, said finger-grip end of said housing having a switch-access opening local to the angular region of adjacency to said other electrode, and a switch subassembly comprising an elongate longitudinally extending stiffly compliant metal strip with an insulating finger-engageable actuator element secured to one side of said strip at one end thereof, said actuator element being radially positioned and movable within said access opening and said strip having relatively close and opposite substantially right-angle bends near said actuator element to define a radially outward offset in axially forward locating abutment with said shoulder, and means at the closed end of said battery-holder cavity providing an axially rearward locating abutment for the other end of said strip and electrically conductive connection of said strip to the rear terminal of an inserted battery, thereby controlling the positioning of said actuator element in said access opening.

4,108,182

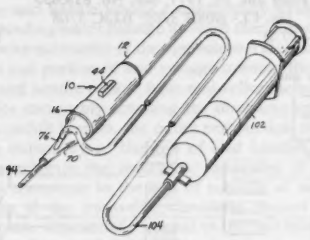
RECIPROCATION VITREOUS SUCTION CUTTER HEAD

Robert M. Hartman, Clearwater, and Arthur F. Trott, Largo, both of Fla., assignors to Concept Inc., Clearwater, Fla.

Filed Feb. 16, 1977, Ser. No. 769,191
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305 12 Claims

1. A surgical cutting device comprising a housing, motor means mounted inside said housing, means to energize said motor means, a shaft mounted to said motor means inside said housing, a cutter head removably secured to said housing, said cutter head comprising a body, an elongated tube secured to said cutter head body, a blade positioned in said tube and adapted to be reciprocated within said tube, said tube provided with an aperture therein to allow said blade to come in contact with tissue, drive transfer means mounted in said cutter head, said drive transfer means comprising a cam connected to said

shaft, a cam follower assembly mounted in said cutter head engaging said cam, said blade means mounted to said cam follower thereby transmitting motion from said motor means to said blade means, said cutter head defining a passage-way

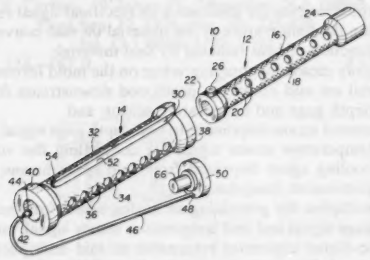


communicating with said tube and adapted to supply a vacuum from an external source to said tube so that tissue sheared off by the reciprocation of said blade inside said tube will be carried off into said passage-way.

4,108,183
DIFFERENTIAL HAIR CURLER

Peter Mauro, 355 S. Oyster Bay Rd., Plainview, N.Y. 11803

Filed Jun. 13, 1977, Ser. No. 805,830
Int. Cl.[2] A45D *2/14*
U.S. Cl. 132—42 A **1 Claim**

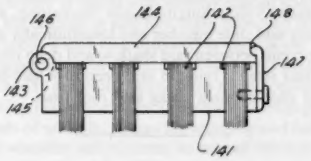


1. An improved differential hair curler of the type comprised of a hair-curling core unit and a cooperating hair-curling outer unit operatively arranged to be disposed in telescoped relation with each other, said core unit having an open-ended through bore and an outer hair curling diameter and said outer unit having a through bore larger than said core outer diameter so as to define a clearance space therebetween for supporting small-radius turns of hair curled about said core unit and a larger outer diameter to support large-radius turns of hair curled about said outer unit, the improvements thereto comprising a radially extending projection located on said core unit adjacent that end thereof which is inserted into said outer unit, said outer unit having a longitudinal slot therein open at one end thereof and adapted to both slidably receive said core unit projection for guided movement thereinto and closed at its other end to retain said projection therein and a strand of hair in curled relation about and behind said core unit projection preparatory to the subsequent curling of said strand of hair about said outer unit, said slot being bounded by side walls effectively confining said core unit projection therebetween so as to prevent rotation of said core unit within said outer unit and thus prevent any inadvertent unraveling of said strand of hair in said supported curled position on said core unit during the sliding of said core into said outer unit, and an elastomeric string connected to one end of said outer unit remote from said open end of said slot to extend in spanning relation between said one end of said outer unit and over to and into retaining engagement with the open end of the bore of said core unit adjacent said open end of said slot that is remote from said projection so as to be adapted to be stretched over the hair in said supported curled positon on said outer unit to engage over the same to prevent any inadvertent unraveling thereof and whereby the urgency in said stretched elastomeric string also maintains said core unit in said telescoped position within said outer unit with said projection maintained in the closed end of said slot and said core within said through bore of said outer unit.

4,108,184
CLAMP DEVICES FOR USE IN SELECTIVELY ALTERING HAIR COLOR

Shila Morganroth, 1225 Waterbury Rd., Highland, Mich. 48031

Division of Ser. No. 592,764, Jul. 2, 1975, which is a continuation-in-part of Ser. No. 481,695, Jun. 25, 1974. This application Nov. 4, 1976, Ser. No. 738,910
Int. Cl.[2] A45D *8/00*
U.S. Cl. 132—46 R **5 Claims**



1. A device for use in selectively altering hair color comprising a pair of bars hinged together at one end having opposed hair engaging surfaces to receive a strand of hair between them, said bars having aligned bottom surfaces permitting the bars to be placed around a strand of hair close to the scalp, means for removably holding the bars with said surfaces in gripping relation to a strand of hair between them, and a hair protecting shield connected to a bar and extendingly only transversely away from the gripping surface adapted to be positioned between a strand gripped by said bars and surrounding hair underlying said shield whereby said strand of hair may be formed by combing and be held in one hand of a person while the clamp in open position is moved transversely across the strand and then closed upon it.

4,108,185
GREASELESS COSMETIC ARTICLE FOR APPLYING MAKE-UP TO THE EYELIDS

Jean P. Boulogne, L'Hay-les-Roses; Thibaud Hochmann, Champigny-sur-Marne; Jacques Michelet, Longjumeau, and Bruno P. Morane, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 20, 1976, Ser. No. 752,806
Claims priority, application France, Jan. 28, 1976, 76 02282
Int. Cl.[2] A45D *33/00*
U.S. Cl. 401—88 **18 Claims**

1. In a cosmetic article for directly applying a greaseless cosmetic, said article comprising a solid support coated with at least one impregnating layer carrying a coating layer containing a cosmetic, the improvement according to which the impregnating layer comprises at least one hydrosoluble polymer deposited in solution on the support, and said coating layer comprising a homogenous mixture containing

(a) a product which is thixotropic in aqueous suspension;

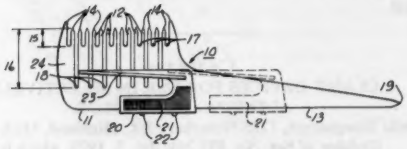
(b) a polymeric binder capable of forming a gel in an aqueous medium, said binder forming, when mixed with said thixotropic product in an aqueous medium, a thixotropic mixture having a high viscosity; and

(c) a mixture of cosmetic powders comprising at least one pigment.

4,108,186
COMB FOR SUBDIVIDING HAIR STRANDS

Victor Esposto, Pittsburgh, Pa., assignor to Frost Enterprises, Inc., Pittsburgh, Pa.

Filed Sep. 27, 1976, Ser. No. 726,563
Int. Cl.[2] A45D *24/00*
U.S. Cl. 132—124 2 Claims

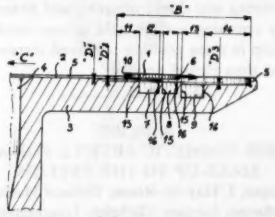


1. A comb for subdividing hair strands comprising an elongated comb root base having a series of parallel comb teeth extending off one edge thereof with the depth of the root space between adjacent teeth from the teeth tops alternately varying between shallow and deep, a slide member slidably secured to said root base to slide longitudinally therealong, a finger extending from said slide member and longitudinally along a side face of the comb between said shallow and deep root spaces to segregate hair strands lying in said deep root spaces at will by sliding said slide member along said root base.

4,108,187
AUTOMATIC SORTER FOR PIECES OF MONEY OR SIMILAR OBJECTS AS A FUNCTION OF THEIR DIAMETER

Nicolas Bezsilko, Tourcoing, France, assignor to S. A. Vandeputte & Cie, Tourcoing, France

Filed May 3, 1976, Ser. No. 682,375
Claims priority, application France, Sep. 22, 1975, 75 29691
Int. Cl.[2] G07D *3/00*
U.S. Cl. 133—3 A 2 Claims

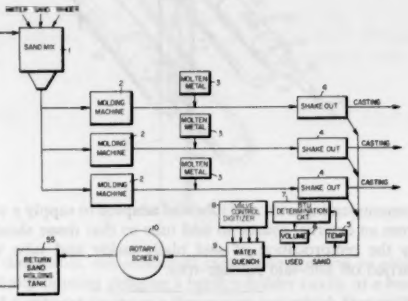


1. In an automatic sorter for pieces of money and similar objects having a rotating disc, an upper surface for said disc, at least one circular groove in said upper surface, an internal edge for said groove located on the side of the center of said disc, an external edge for said groove located on the side of the periphery of said disc, said groove dividing the upper surface of said disc into several portions on which the pieces of money are displaced sliding flat under the action of centrifugal force resulting from the rotation of said disc moving the pieces of money from the center of the disc, the improvement comprising, when said disc is seen in axial cross-section, a portion of said surface adjacent said internal edge of said groove being at a level at least slightly higher than that of a portion of said surface adjacent said external edge of said groove whereby the pieces of money are prevented from engaging said external edge of the groove and also whereby said internal edge of the groove prevents the pieces of money from returning towards the center of the disc.

4,108,188
SAND COOLER CONTROL SYSTEM

Carl R. McMullen, Waverly, Tenn., and Gary M. Schlageter, Carpinteria, Calif., assignors to Foundry Technology, Inc., Waverly, Tenn.

Filed Jul. 25, 1977, Ser. No. 818,655
Int. Cl.[2] B08B *3/02*; B22C *5/08*
U.S. Cl. 134—57 R 5 Claims

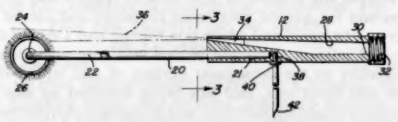


1. In a control system for an apparatus used for cooling recycled foundry said in a sand cast foundry, having:
conveyor for transporting the foundry sand material,
a non-contact depth gage disposed along the path of the conveyor for generating an electrical signal representing the depth of the material on said conveyor;
a non-contact temperature sensor disposed along the path of the conveyor for generating an electrical signal representing the temperature of the material on said conveyor as a function of heat radiated by said material;
a spray means for spraying water on the mold forming material on said conveyor positioned downstream from said depth gage and temperature sensor; and
a control means responsive to said depth gage signal and said temperature sensor signal for controlling the volume of cooling agent dispensed from said spray means; the improvement comprising,
a multiplier for generating an analog signal from said depth gage signal and said temperature sensor signal; an analog-to-digital converter responsive to said multiplier analog signal for producing a plurality of digital signals as a function of the magnitude of said analog signal; and
switching means responsive to said outputs of said analog-to-digital converter for activating said spray means.

4,108,189
PAINT ROLLER CLEANER AND DRYER

Floyd H. Claiborne, 318 Louise Ave., and Roggie C. Ray, P.O. Box 366, both of Gallatin, Tenn. 37066

Filed Feb. 7, 1977, Ser. No. 766,034
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—138 2 Claims



1. A paint roller assembly including an elongated handle having opposite end faces, an elongated frame having one base end portion anchored in one end of said handle with said frame projecting endwise outwardly from the corresponding end face of said handle and including a second free end portion disposed generally normal to the longitudinal axis of said handle, a paint roller journaled from said free end portion with a

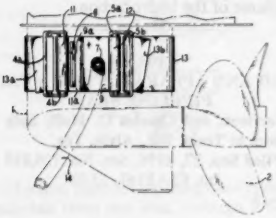
first plane generally normal to said roller and containing said longitudinal axis passing through said roller centrally intermediate its opposite ends, said frame, intermediate said base and free end portions including a laterally offset portion disposed to one side of the longitudinal axis of said handle extending between and rigidly interconnecting said base and free end portions, said handle having a substantially straight longitudinally extending water passage forward therethrough and opening endwise outwardly of the opposite end faces of said handle, the inlet end portion of said passage opening through the end face of said handle remote from said roller including coupling means for removably coupling the discharge end of a water supply conduit thereto, the outlet end portion of said passage opening outwardly of the end of said handle adjacent said roller tapering in the transverse dimension of said passage disposed transverse to the axis of rotation of said roller and increasing in the transverse dimension thereof normal to a second plane substantially normal to the first mentioned plane and intersecting with said roller along a short chord plane thereof, whereby the terminal end of said outlet end portion defines an elongated discharge slot for discharging a fan-shaped stream of water therefrom along said second plane, said roller assembly being entirely free of shroud structure even partially shrouding said roller, said coupling means comprising a threaded female coupling supported from said handle for removably threaded connection of a threaded male coupling on the discharge end of said water supply conduit to said handle in communication with said passage.

4,108,190

FLUSHING TECHNIQUE AND APPARATUS FOR OUTBOARD AND STERN-DRIVE MOTORS

Gordon R. Carlson, 19 James Pl., Metuchen, N.J. 08840

Filed Sep. 22, 1976, Ser. No. 725,478
Int. Cl.[2] B08B *3/02, 9/00*
U.S. Cl. 134—167 R **8 Claims**



1. A flushing system for outboard and sterndrive motors having an external motor housing which includes at least two water intake ports substantially spaced apart around the periphery of said housing, said system comprising:

a belt of resilient elastomer material substantially impervious to water which is constructed and arranged to wrap around and adhere to that portion of the external motor housing which includes said spaced apart water intake ports,

locking means for securely fastening the two terminal portions of said belt to retain said belt in said wrap-around position,

said belt including means comprising an opening constructed in said wrap-around position to register with at least one said water intake port of said housing,

said means comprising an opening including a fitting for accommodating a hose terminal,

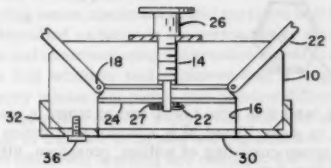
wherein in said wrap-around position a portion of said belt adheres to another one of said ports and is constructed and arranged to operate as a valve flap which opens and closes in response to the waxing and waning of the pressure of water passing into said motor housing through said hose terminal.

4,108,191

FAN MESH DISRUPTER

Arthur T. Merriam, Wellesley Hills, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 17, 1975, Ser. No. 614,389
Int. Cl.[2] A45F *1/04*
U.S. Cl. 135—2 **1 Claim**



1. An expandable-retractable fan mesh disrupter for use in camouflaging equipment attached thereto, said disrupter comprising: a hub provided with a threaded top opening, said hub having a plurality of radial slots equally spaced about its outer periphery, the bottom of said hub being provided with a counter-bored recess; a split ring disposed in said recess; a plurality of mesh supporting ribs attached to said split ring, said ribs being disposed in said slots; camouflage mesh connected to said ribs; a locking plate located in said recess to engage and support the ends of said ribs; means for securing said locking plate to said hub whereby said ribs may be moved thereon to expand or retract camouflage mesh disrupter, said securing means including a lock screw for engaging said threaded top opening and a cotter pin at the lower end of said lock screw for engaging said locking plate, and a spacer cup connected to said hub and a flange extending upward from said cup and surrounding said hub to limit movement of said ribs in said radial slots.

4,108,192

METHOD FOR SEWAGE REMOVAL FROM MULTI-HOUSEHOLD CONNECTIONS

Harald Richard Michael, Hamburg, Germany, assignor to Electrolux GmbH, Germany

Filed Oct. 27, 1976, Ser. No. 736,209
Int. Cl.[2] E03F *1/00*
U.S. Cl. 137—1 **3 Claims**

1. A method for the disposal of sewage from multi-household connections, the sewage from each household connection comprising the total wastewater from the household, in which a specific volume of sewage is first collected and then suctioned off by means of vacuum, and in which air is released into the vacuum pipe following the sewage, characterized in that the collection of the sewage takes place at each household respectively and in relatively small quantities about 5 to 30 liters, and in that the amount of air subsequently released into the vacuum pipe amounts to two to fifteen times the volume of the sewage.

4,108,193

PIPELINE METHOD FOR TRANSPORTING VISCOUS HYDROCARBONS

Kenoth H. Flournoy, Levelland; Ricardo L. Cardenas, and Joseph T. Carlin, both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,712
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.[2] F17D *1/17;* **B01F** *17/00*
U.S. Cl. 137—13 **6 Claims**

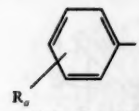
1. In the transportation of viscous hydrocarbons by pipeline, the improvement which comprises introducing into said pipeline with said hydrocarbons an aqueous solution comprising

from about 0.01 to about 2.0 weight percent of an anionic surfactant selected from the group consisting of:

(A) compounds of the formula:

$$RO(CH_2CH_2O)_gSO_3M$$

wherein R is selected from the group consisting of alkyl of from 8 to 25 carbon atoms and

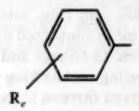


wherein R_a is alkyl of from 8 to 20 carbon atoms, g is an integer of from 1 to about 20 and M is a monovalent cation selected from the group consisting of sodium, potassium, lithium and the ammonium ion;

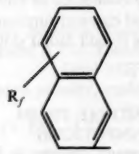
(B) sulfonates of the formula:

$$R_dO(CH_2CH_2O)_hCH_2CH_2SO_3M,$$

wherein R_d is selected from the group consisting of alkyl of from 8 to 20 carbon atoms;



wherein R_e is alkyl of from 8 to 20 carbon atoms and

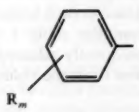


wherein R_f is alkyl of from 1 to 10 carbon atoms; h is an integer of from 1 to 24 and M has the same meaning as described in (A);

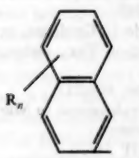
(C) sulfonates of the formula:

$$R_kO(C_2H_4O)_r-(C_3H_6O)_s-(C_2H_4O)_tCH_2CH_2SO_3M,$$

wherein R_k is selected from the group consisting of alkyl of from 8 to 20 carbon atoms;



wherein R_m is alkyl of from 8 to 20 carbon atoms, and



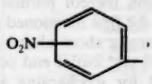
wherein R_n is alkyl of from 1 to 10 carbon atoms; r is an integer of from 1 to about 18; s is an integer of from about 1 to about 12; t is an integer of from 1 to about 20, and the sum of $r + s + t$ is not more than 30, wherein at least 60 percent of the oxyalkylene units are oxyethylene units and wherein M has the same meaning as described in (A) above, and

(D) mixtures of the above described surfactants; from about 0.01 to about 1.0 weight percent of an alkalinity agent selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide and mixtures thereof and from about 0.01 to about 0.50 weight percent of a material selected from the group consisting of (a) a guanidine salt, (b) an oxyalkylated nitrogen-containing aromatic compound having the formula:

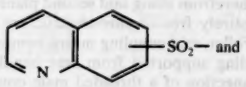
$$R_v(OR_w)_xOH,$$

wherein R_v is selected from the group consisting of:

(a)

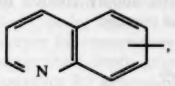


(b)



and

(c)



wherein R_w is alkylene of from 2 to 4 inclusive carbon atoms and x is an integer of from about 5 to about 50 (c) mixtures of (a) and (b) above, and wherein amount of the said aqueous solution introduced in the said pipeline ranges from about 10 to about 40 percent by volume based on the volume of the hydrocarbon.

4,108,194

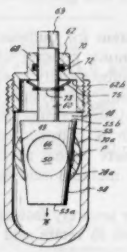
METHOD AND APPARATUS FOR A TAPERED PIPELINE SEAL

George W. Harrison, and Charles O. Huff, both of Houston, Tex., assignors to Team, Inc., Alvin, Tex.

Filed Sep. 27, 1976, Ser. No. 726,813

Int. Cl.[2] F16L *55/07*

U.S. Cl. 137—15 **2 Claims**



1. A method of sealing a longitudinal bore in a pipeline including the steps of:

(a) forming a housing for mounting with a pipeline, said housing including two sections;

(b) said method of forming said sections including the steps of:

positioning and securing longitudinal arcuate members relative to the pipeline with transversely positioned communication members; and

(c) mounting said first and second sections around the pipeline such that the arcuate members are mounted with and parallel to each other around the pipeline to form a sheath and wherein the communication members mounted with each of said arcuate sections are axially aligned with each other and transverse to the sheath and pipeline;

(d) drilling and reaming a tapered hole in the communication members and through and transverse to the arcuate members and pipeline such that the communication members are enabled to communicate with each other through such tapered opening;

(e) inserting a tapered plug into the tapered hole to prevent communication between the longitudinal bore of the pipeline to thereby seal off the bore of the pipeline.

4,108,195

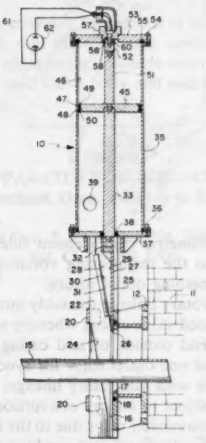
QUICK-CLOSING FIRE GATE

Henry K. Berry, 31 Towne Square Dr., Newport News, Va. 23607

Filed Jun. 23, 1977, Ser. No. 809,205

Int. Cl.[2] F16K *17/40*

U.S. Cl. 137—68 A **8 Claims**



1. For production facilities utilizing conveyors for transportation of materials from one area, through a barrier and into another area, a quick-closing fire gate located at such barrier and comprising in combination:

a housing having a passageway extending from a flat forward surface through the entire length of said housing and being of sufficient size to allow the passage of a conveyor and materials thereon to pass therethrough;

first and second inclined plane members positioned adjacent said housing forward surface directly before said passageway such that the inclined surfaces slope toward said housing forward surface from top to bottom;

a flat blade, having a sharpened base and front and back sides, translatable from a starting position above, to a terminating position before said housing forward surface of sufficient dimension to cover said passageway;

means for guiding said blade from said starting to said terminating position;

third and fourth inclined plane members attached to said blade back side and positioned such that the inclined surfaces thereof contact said inclined surfaces of said first and second inclined plane members and press said blade front side against said housing forward surface;

a fixed cylinder containing a reciprocal piston therein, said piston having a line of action through said blade starting and terminating positions;

means to operatively connect said piston to said blade to thereby control the translation of said blade by said piston;

means to create a pressure differential within said cylinder across said piston such that the pressure above said piston is the greater;

an explosive bolt piercing said cylinder above said piston and having means to hold said piston against the force of said differential pressure such that said blade is maintained at said starting position;

triggering means connected to said explosive bolt for sensing an identified variation in the surroundings about said fire gate and communicating a detonation signal to said explosive bolt whereby said explosive bolt is fragmented to thereby release said piston, said pressure differential forcing said piston rapidly away from said bolt causing said blade to translate from said starting position, said sharpened blade base severing said conveyor during such translation and said inclined surfaces of said third and fourth inclined plane members contacting and sliding along said inclined surfaces of said first and second inclined plane members such that said blade is pressed flat against said housing forward surface and prevented from rebounding from said terminating position thereby closing said passageway in a very short time.

4,108,196

BALL VALVES

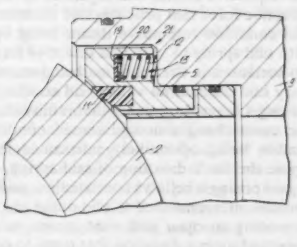
Michael Arnold Calvert, Kirkcaldy, Scotland, and David Joseph Senger, Hammond, La., assignors to TK Valve Limited, Dunfermline, Scotland

Filed Dec. 9, 1976, Ser. No. 748,905

Claims priority, application United Kingdom, Nov. 13, 1976, 47380/76

Int. Cl.[2] F16K *13/04*

U.S. Cl. 137—72 **14 Claims**



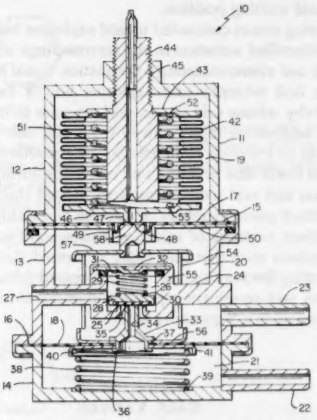
1. A ball valve, especially for use between adjacent sections of a pipe line conducting an inflammable fluid, said ball valve comprising a valve housing a valve ball in said housing and having a through-passage, a trunnion in said housing projecting into a first socket in said ball, a control shaft projecting into and drivingly engaging a second socket in said ball diametrally opposed to said first socket, a pair of annular valve seat members made of metal and spaced axially of the pipe line, and spring means urging said seat members into sealing engagement with the ball; in which a heat-sensitive bush is provided between said trunnion and the peripheral wall of said first socket and between said control shaft and the peripheral wall of said second socket, and said spring means presses against heat-sensitive material; whereby, in the event of fire or excessive heat reaching a ball valve in a pipe line, and the valve is turned to its closed position, said bushes disintegrate, and said heat-sensitive material disintegrates so that the valve seat members are no longer spring urged, and the ball moves axially of the pipe line, under pressure of the fluid in the pipe line, and pushes the downstream valve seat member into sealing contact with the valve housing.

4,108,197

CONDITION RESPONSE DIFFERENTIAL VACUUM REGULATOR AND METHOD OF MAKING THE SAME

Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 23, 1977, Ser. No. 771,163
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—81 **2 Claims**



1. In a differential vacuum regulator having an input chamber and an output chamber and control means for providing an output signal in said output chamber that has a constant differential value from the value of an input signal in said input chamber, said regulator having condition responsive means independent from the value of said input signal for varying said differential value in relation to the condition being sensed by said condition responsive means, said regulator having a spring that has an effective force that provides said constant differential value, said condition responsive means being operatively associated with said spring to vary said effective force thereof in response to variations in the condition being sensed thereby to thereby vary said differential value, said condition responsive means having a movable member that is moved relative to said regulator upon changes in said sensed conditions, said movable member being operatively interconnected to said spring to oppose the force direction of said spring, said movable member comprising a bellows construction, said regulator having vent means interconnected to said outlet chamber, said spring force tending to open said vent means, said bellows construction expanding in a direction that tends to oppose said spring force, said vent means being intermediate said bellows construction and said spring, the improvement wherein said regulator has a cage-like member surrounding said vent means and operatively interconnecting said bellows construction and said spring together.

4,108,198

MULTIROTARY ENERGY CONVERSION VALVE

Will Clarke England, 7310 Eastcrest Dr., Austin, Tex. 78752

Continuation-in-part of Ser. No. 466,874, May 2, 1974, Pat. No. 4,044,562, and a continuation-in-part of Ser. No. 467,482, May 2, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,573
Int. Cl.[2] G05D *7/00*
U.S. Cl. 137—194 **12 Claims**

1. A multirotary energy conversion valve for fluids comprising:

(a) a sealed valve casing;

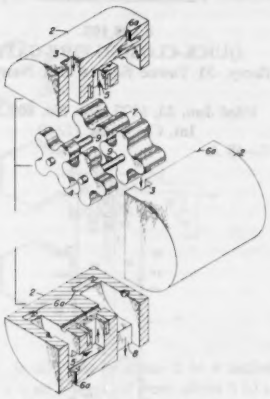
(b) a pair of continuously meshing inlet rotors of constant volumetric displacements in the meshing irregular peripheries of said rotors rotatably mounted in said valve casing;

(c) a pair of continuously meshing outlet rotors of constant volumetric displacements in the meshing irregular peripheries of said rotors rotatably mounted in said valve casing; said outlet rotors having torque characteristics and volumetric displacement rates quantitatively unequal to the torque characteristics and volumetric displacement rates of said inlet rotors;

(d) an inlet passage in said valve casing leading to the reappearing volumetric displacement said of said meshing inlet rotors;

(e) an outlet passage in said valve casing leading from the vanishing volumetric displacement side of said meshing outlet rotors;

(f) an enclosed channel in said valve casing leading from the



vanishing volumetric displacement side of said meshing inlet rotors to the reappearing volumetric displacement side of said meshing outlet rotors;

(g) at least one rotary linkage rotatably mounted completely inside said sealed valve casing whereby said rotary linkage does not extend outside of said casing, connecting one inlet rotor and one outlet rotor for synchronous rotation about one axis with said rotary linkage; and

(h) said fluid subject to energy conversion in said multirotary energy conversion valve due to the interaction of said meshing inlet rotors and said meshing outlet rotors and said fluid in said enclosed channel whereby there is at least an interchange in the kinetic and potential energies of said fluid.

4,108,199

ISOLATING VALVES

Maurice Bonafous, Oloron, France, assignor to Applications Mechaniques et Robinetterie Industrielle, Paris, France

Filed Mar. 11, 1976, Ser. No. 665,766
Claims priority, application France, Mar. 11, 1975, 75 07569
Int. Cl.[2] F16K *1/226, 1/44, 24/02*
U.S. Cl. 137—312 **11 Claims**

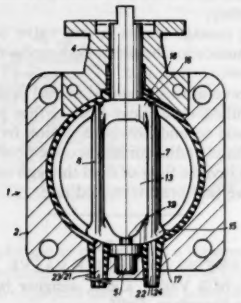
1. An isolating butterfly valve, comprising:

a valve body having an upstream portion and a downstream portion, and orifice means between said upstream and downstream portions;

a pair of joined discs axially spaced in the direction of fluid through-flow and housed within said body, means including spindles pivotally mounting said pair of discs for rotation in said valve body between a valve closed position closing off said upstream and said downstream portions and a valve open position opening said upstream and said downstream portions to each other;

closing means separate from said spindles on said discs for closing said orifice means in the valve open position and opening said orifice means into said valve body in the

valve closed position, said closing means being controlled by the rotation of said spindle, said orifice means being positioned between said discs in the valve closed position for opening the space between said discs to the exterior of the valve; and



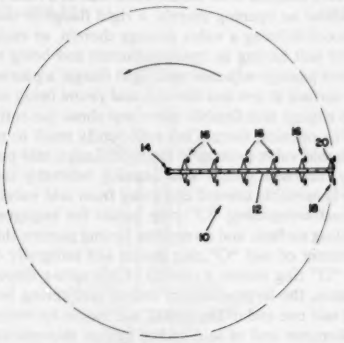
a flexible sleeve covering the interior of said valve body and together with said discs forming corresponding bearing surfaces and constituting a double upstream/downstream seal between said valve body and said discs in the valve closed position.

4,108,200

BRAKE APPARATUS FOR IRRIGATION LINE

Gail Cornelius, Portland, Oreg., assignor to R. M. Wade & Co., Portland, Oreg.

Filed Dec. 1, 1976, Ser. No. 746,456
Int. Cl.[2] B05B *3/06*
U.S. Cl. 137—344 **16 Claims**



1. Irrigation line braking apparatus comprising:

frame means for supporting an irrigation line;

drive means comprising rotatable support means mounted to said frame means and on which the frame means are supported with the support means on the ground; rotary drive means rotatably mounted relative to the frame means and rotatable upon supply of water pressure thereto; and means operatively coupling said rotary means and rotatable support means for providing that the rotary means apply driving torque therethrough to the rotatable support means;

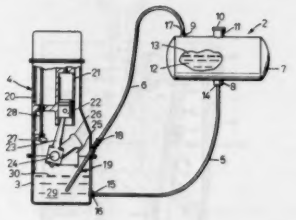
brake means operatively associated with said rotary drive means for providing braking means of the irrigation line upon water pressure supplied to said rotary means falling below a certain level, and for providing release of braking of the irrigation line upon water pressure supplied to said rotary means rising above said certain level.

4,108,201

SENSING PROBE FOR GRAVITY INDUCED FLOW LIQUID LEVEL REGULATOR

James R. Lang, Littleton, Colo., assignor to The Mechanex Corporation, Denver, Colo.

Filed Feb. 14, 1977, Ser. No. 768,206
Int. Cl.[2] F16K *21/20*
U.S. Cl. 137—393 **15 Claims**



1. In a sensing conduit for a gravity induced flow liquid level regulator, said sensing conduit having a first end adapted for being sealingly connected to fluid flow communication with a liquid reservoir and a second end being open and being adapted for extending into a liquid containing sump and having position maintenance means for maintaining said second end at a desired level within said sump and for maintaining said first end at a level above said second end, the improvement comprising:

a tubular shield surrounding said open end of said sensing conduit and a portion of said sensing conduit above said open end of said sensing conduit, said shield further extending a substantial distance beyond said open end of said sensing conduit and terminating in an end having a liquid flow passage, said end of said shield having said liquid flow passage being adopted for being immersed a substantial distance into a pool of liquid in said sump when said open end of said sensing conduit is maintained at the desired level in said sump for enabling said liquid in said sump to flow into and out of said shield;

means for maintaining said shield and said sensing conduit in fixed position relative to each other; and

a longitudinal fluid flow passage formed between an exterior surface of said sensing conduit and an interior surface of said shield, said longitudinal fluid flow passage extending upwardly from said open end of said sensing conduit and vent means in said shield for placing said longitudinal fluid flow passage in fluid flow communication with an air space above said liquid in said sump for enabling air to flow through said vent means and said longitudinal fluid flow passage to said open end of said sensing conduit.

4,108,202

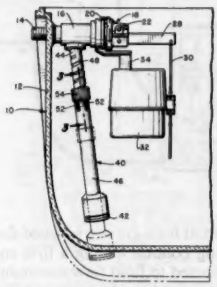
BALL COCK HAVING VERTICALLY ADJUSTABLE OUTLET TUBE

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631

Filed Jul. 19, 1976, Ser. No. 706,484
Int. Cl. F16k *31/18;* **F16l** *15/02*
U.S. Cl. 137—436 **4 Claims**

1. In a ball cock for controlling the level of liquids such as water in a tank, the ball cock being of the type having an inlet tube with an outer end in communication with a water supply through a tank wall, a generally vertical outlet tube for the flow of water downwardly therethrough within said tank, a float controlled valve between an inner end of said inlet tube and an upper end of said outlet tube, and a water outlet opening communicating into said tank at a lower end extremity of said outlet tube; the improvements comprising: said outlet tube having vertically end telescoping upper and lower parts internally vertically communicating during varying amounts of said vertical end telescoping; generally radially extending and interengaged adjustment means between said tube upper and

lower parts normally positively resisting at least straight vertical movement between said tube upper and lower parts but being selectively operable for increasing and decreasing said tube upper and lower part end telescoping to selectively vary the downward vertical extension of said outlet tube from said valve, said adjustment means including a spiral groove on one of said outlet tube upper and lower parts and a rigid radial projection on the other of said upper and lower parts, said rigid radial projection normally being positively engaged into said



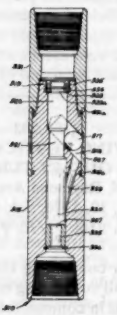
spiral groove with relative rotation between said tube upper and lower parts causing increasing and decreasing of said tube upper and lower part end telescoping, said adjustment means also including selectively operable release means operable at any upper and lower part end telescoping for permitting upon operation thereof total radial separation between said spiral groove and said rigid radial projection to thereby permit free relative vertical movement as well as complete vertical separation between said outlet tube upper and lower parts.

4,108,203

CHECK VALVE ASSEMBLY

Cicero C. Brown, deceased, late of Houston, Tex. (by Joe R. Brown, executor), assignor to Brown Oil Tools, Inc., Houston, Tex.

Division of Ser. No. 495,901, Aug. 8, 1974, Pat. No. 4,040,441. This application May 9, 1977, Ser. No. 794,713
Int. Cl.[2] F16K *15/04*
U.S. Cl. 137—496 **11 Claims**



1. A check valve assembly for permitting unrestricted flow in one direction and limited flow in the reverse direction comprising:

(a) a valve body having a longitudinal flowbore comprising first and third concentric sections connected by a second concentric section of restricted diameter;

(b) seat means carried by said valve body at one end of said third flowbore section;

(c) recess means in said valve body communicating with said flowbore near the junction of said second and third flowbore sections;

(d) ball closure means carried in said recess means out of said flowbore but movable into said flowbore for sealing engagement with said seat means, in response to a predetermined rate of reverse flow through said check valve assembly, to block reverse flow of fluids through said check valve assembly;

(e) equalizing passage means in said valve body providing fluid communication between said recess means and said first flowbore section; and

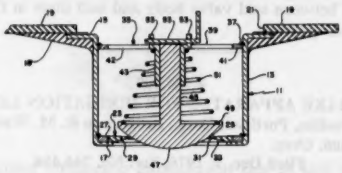
(f) tubular sleeve means mounted in said first flowbore section for limited movement from a first position downstream of said second flowbore section to a second position immediately adjacent said second flowbore section in response to reverse flow of fluid through said check valve means above said predetermined rate.

4,108,204

PRESSURE RELIEF VALVE

Ronald H. Day, Mill Valley, Calif., assignor to C. J. Hendry Company, San Francisco, Calif.

Filed May 13, 1976, Ser. No. 686,025
Int. Cl.[2] F16K *15/06*
U.S. Cl. 137—543.13 **3 Claims**



1. A pressure relief valve comprising a housing having one end thereof adapted to be secured at a wall of a fluid containing vessel about an opening therein, a rigid flange at the opposite end thereof defining a valve passage therein, an entirely flexible valve seat having an opening therein and being secured in said valve passage adjacent said rigid flange, a piston having a sealing surface at one end thereof, said piston being sufficiently large to engage said flexible valve seat about the entire periphery of the opening therein but sufficiently small to pass freely through said valve passage in the rigid flange, said piston being slidably disposed within said housing whereby said sealing surface is movable toward and away from said valve seat, said valve seat comprising "O" ring means for engagement with said sealing surface, and an annular flexing portion thinner than the diameter of said "O" ring means and integrally connected to said "O" ring means, a conical volute spring disposed about said piston, the large diameter end of said spring being urged against said one end of the piston, and means for restraining the small diameter end of said spring against movement whereby said spring resiliently urges the sealing surface toward the valve seat.

4,108,205

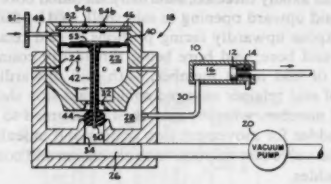
VALVE ARRANGEMENT

Jack S. Hawley, Berkeley, Calif., assignor to Pneumeric Corp., Castro Valley, Calif.

Filed Feb. 28, 1977, Ser. No. 772,461
Int. Cl.[2] F16K *11/04*
U.S. Cl. 137—554 **2 Claims**

1. A valve arrangement for amplifying the effect of the application of the atmosphere on, or its removal from an air pressure responsive element, such as a bellows or a pneumatic cylinder, comprising in superposition an air admission chamber, an evacuation chamber and intermediately thereof a conduit leading to the air pressure responsive element, said chambers and said conduit having vertically aligned openings estab-

lishing communication between said air admission chamber and said conduit and between said evacuation chamber and said conduit, a stopper movable between said openings to close one or the other, and means for actuating said stopper comprising a flexible diaphragm forming the ceiling of said air admission chamber, a stem attached to said diaphragm and mounting said stopper, an air pressure responsive actuating chamber



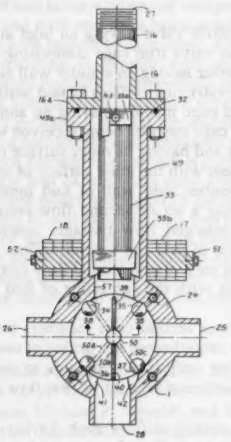
having said diaphragm as its floor and a transparent ceiling, an air admission opening, and a channel leading from said evacuation chamber through said stem to said control chamber, relatively spaced strips of conductive material arranged circumferentially in and around said transparent ceiling and a ring of conductive material arranged upon said diaphragm to act as a switch for activating visible or audible signals whenever said diaphragm reaches its highest position.

4,108,206

HERMETICALLY SEALED FOUR-WAY VALVE

Donald C. Mountain, 2812 King Rd., North Kingsville, Ohio 44068

Filed Aug. 30, 1976, Ser. No. 718,988
Int. Cl.[2] F16K *11/10*
U.S. Cl. 137—596.17 **14 Claims**



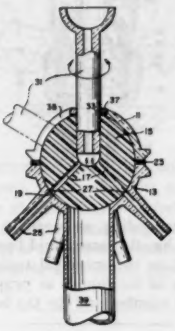
1. A four-way electromagnetically controlled valve having a vane housing with a plurality of exit ports and an internal rotating vane for switching the flow from one exit port to another exit port, a pivoting flow nozzle, electromagnet means for pivoting the flow nozzle from side to side, the fluid discharge of the said pivoting nozzle turning said rotating vane, a stop means for holding the vane in final fluid delivery position, and electromagnets for holding the vane against said stop means.

4,108,207

MULTIPLE-PORT VALVE

Thomas J. Doody, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 13, 1977, Ser. No. 787,137
Int. Cl.[2] F16K *5/06, 11/087*
U.S. Cl. 137—625.47 **10 Claims**



1. A multiple-port valve assembly for interconnecting a primary conduit with one or more of a plurality of secondary conduits comprising:

a first generally hemispherical socket having a slotted opening that movably receives said primary conduit;

a second generally hemispherical socket rotatably and sealingly attached to said first socket to define a generally spherical volume within the two sockets;

said second socket having a plurality of openings each in fixed communication with one of said plurality of secondary conduits;

a generally spherical, solid plug rotatably received within said spherical volume within the two sockets, said plug having a first passageway for receiving an open end portion of said primary conduit and having a plurality of secondary passageways each extending from said first passageway to one of a plurality of ports within the outer surface of said plug, the plurality of ports being alignable each with at least one of said plurality of openings within said second hemispherical socket by rotation of the plug about an axis coinciding with the received primary conduit end portion, by tilting the primary conduit within the slotted opening of the first hemispherical socket and by rotating the first hemispherical socket along with the spherical plug in relation to the second hemispherical socket.

4,108,208

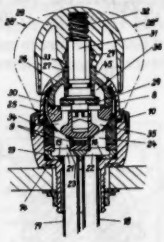
MIXING TAP

Paul Saffin von Corpon, 1, Rue du Village, Genthod, Geneva, Switzerland (1294)

Filed Feb. 22, 1977, Ser. No. 770,746
Int. Cl.[2] F16K *11/18, 5/06*
U.S. Cl. 137—636.3 **8 Claims**

1. A manually-adjustable mixing tap of the type comprising a spherical control member fluid-tightly swivelably mounted inside a tap body and carrying a manoeuvring handle comprising screw means for actuating a valve mounted in an inner mixing chamber of the control member, the control member having at least three peripheral openings for the inlet and outlet of liquids into and from the mixing chamber, said tap body having ducts cooperating with and selectively connecting said liquid inlet and outlet openings as a function of the position of the control member, the rate of flow from the mixing chamber being a function of the position of the valve, annular lips carried by the tap body, each annular lip surround-

ing one of the liquid inlet ducts at a location facing the control member, and a flexible annular tongue disposed in an annular chamber formed between the control member and the tap body, said annular chamber communicating with the liquid



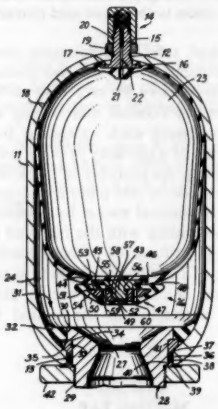
inlet ducts and surrounding an opening of the tap body through which said handle passes, said lips and tongue being fluid-tightly applied on the spherical surface of the control member by pressure of the liquids to provide fluid-tightness between the control member and the tap body.

4,108,209

SILENT-ACTING HYDRAULIC ACCUMULATOR DEVICE

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, CA

Filed Apr. 25, 1977, Ser. No. 790,324
Int. Cl.[2] F16L *55/00*
U.S. Cl. 138—30 **3 Claims**



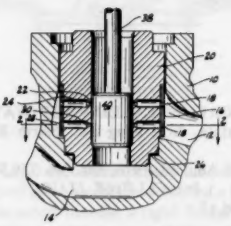
1. A silent acting hydraulic accumulator-pulsation dampener device comprising, in combination, a pressure vessel including a gas charging port at one end and an oil port at the other end, said oil port including a removable flared valve seat portion directed toward the interior of said vessel, a distensible elastomeric bladder assembly mounted within said vessel and dividing the same into two chambers in communication, respectively, with said oil port and said gas charging port, a metallic insert member fixed to an end portion of said bladder in opposed relation to said oil port, said insert member including a base embedded in the wall of said bladder with no portion of said insert extending into said chamber communicating with said gas charging port, a stop shoulder spaced from said base and directed toward said valve seat, and a threaded stem projecting beyond said shoulder, and a replaceable valve member mounted on said stem, said valve member comprising a frustoconic elastomeric shell portion sized to pass through said oil port and including a major base engaging said end portion of said bladder, a minor base of smaller diameter directed toward said seat, and side walls tapered to conform to the flare of said seat, an internal, upwardly open cavity formed within said shell portion and including an undercut annular groove, and a metallic retainer member disposed within said cavity and including flange portions extending into said undercut groove to lock said retainer member to said shell, said retainer member including an axially directed, internally threaded bore in registry with said upward opening in said shell, said opening being sized to expose upwardly facing portions of said retainer surrounding said bore; said bore being threadedly connected to said stem of said insert member, with said upwardly facing portions of said retainer engaged against said stop shoulder of said insert member, whereby said shell is mounted to said end of said bladder for movement into sealing and unsealing positions of said valve seat responsive to expansion and contraction of said bladder.

4,108,210

CONTROL VALVE TRIM ASSEMBLY

Fred J. Luthe, and Allen E. Hays, both of Marshalltown, Iowa, assignors to Fisher Controls Company, Marshalltown, Iowa

Continuation of Ser. No. 404,820, Oct. 9, 1973, abandoned. This application Sep. 2, 1976, Ser. No. 719,754
Int. Cl.[2] F16K *47/08*
U.S. Cl. 138—42 **6 Claims**



1. In a fluid control valve having an inlet and an outlet, a cavitation-resistant valve trim cage comprising:

a first cage member having an annular wall and having a set of first flow-restricting orifices in said wall;

an inner second cage member having an annular wall, said inner second cage member being received within said first cage member and having its outer surface in circumferential engagement with the inner surface of said wall of said first cage member, said wall of said inner second cage member having a set of second flow-restricting orifices and having enlarged flow passages communicating between said sets of first and second orifices;

the centerline of each of said second flow-restricting orifices corresponding with the centerline of said enlarged flow passages;

said first and inner second cage members being positioned such that the centerline of any orifice of said set of second flow-restricting orifices corresponds to the centerline of the aligned orifice of said set of first flow-restricting orifices;

said first and second orifices each having radiused inlet portions having a radius of curvature between 30 and 80 percent of the diameter of said orifices;

said second orifices each being diametrically opposed to another in said wall of said second cage member; and

wherein flow through said cage members is from outside said first cage member to inside said second inner cage member,

whereby the fluid jets through said diametrically opposed second orifices expend energy impinging upon one another rather than on the valve body or internal valve elements.

4,108,211
ARTICULATED, FOUR-WAY BENDABLE TUBE STRUCTURE

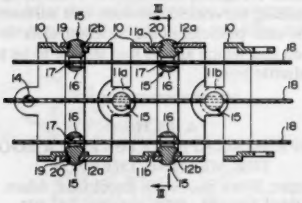
Hitoshi Tanaka, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Apr. 21, 1976, Ser. No. 678,736

Claims priority, application Japan, Apr. 28, 1975, 50-58151[U]; Jun. 3, 1975, 50-74968[U]

Int. Cl.[2] F16L *11/18*

U.S. Cl. 138—120 **8 Claims**



1. An articulated tube structure which can be bent selectively in four different directions by means of pull members extending therethrough, comprising in combination, a plurality of relatively short elementary tubes arranged end-to-end with uniform spacings therebetween and having a common axis when in alignment, a pair of lugs formed in diametrically opposite positions on one end of each of said elementary tubes, said pair of lugs being depressed radially inwardly of each said elementary tube so as to underlie the adjacent elementary tube, there being a first pair of pivot holes formed respectively in each of said pair of lugs on each of said elementary tubes, there being a second pair of pivot holes formed in diametrically opposite positions in the other end of each of said elementary tubes, said second pair of pivot holes in each of said elementary tubes being angularly spaced around said axis 90° from said first pair of pivot holes and being aligned respectively with said first pair of pivot holes in the next adjacent pair of lugs lying thereunder and thereby forming two pairs of aligned pivot holes for each of said tubes with one of said pairs being at each end of the tube and with said pairs being angularly spaced 90° around said axis with respect to each other, a plurality of pivot members corresponding in number with said aligned pivot holes and associated respectively therewith, each of said pivot members having a shank portion which is snugly received in its aligned holes to provide a pivotal connection therebetween and also having a bracket portion positioned toward said axis and having a bore therethrough which is parallel to said axis, whereby there are four of said bores upon said pivot members of each of said tubes which are angularly spaced 90° from each other with respect to said axis, and four pull members extending the length of said tube structure in parallel relationship when said tubes are in axial alignment and extending through the respective bores with each pull member extending through a bore of a pivot member for each of said tubes.

4,108,212
CORRUGATED FLEXIBLE METAL TUBING AND METHOD AND APPARATUS FOR MAKING SAME

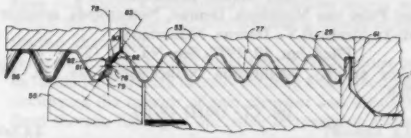
Leroy E. Anderson; Michael P. Schmidt, and William W. Weaver, all of Detroit Lakes, Minn., assignors to Manufacturers Systems, Inc., Detroit Lakes, Minn.

Filed Feb. 9, 1976, Ser. No. 656,389

Int. Cl.[2] F16L *11/16*

U.S. Cl. 138—122 **20 Claims**

1. A corrugated cylindrical tube comprised of a single narrow strip of formable material helically wound into contiguous convolutions and defining a tube having adjacent circumferentially extending corrugations therein, said corrugations each having a bottom bounded by opposed radially extending legs, said strip having marginal portions each with a free edge supported at opposite sides thereof and reversed upon itself in opposite directions to form a U-shaped seam element at each side thereof having opposed legs, the free edge of each of said marginal portions being received between the legs of one of said seam elements of the convolution of said strip contiguous thereto and thereby cooperatively defining a radially extending seam and comprising a common leg of a corrugation for the



contiguous convolutions of said strip, each of said seam elements being deformed intermediate its ends in cooperative interlocking relation at a plurality of radially spaced locations along the slope of the corrugation leg which said seam elements comprise, each of said seam elements being deformed at each of said locations in a direction opposite to that of its adjacent deformation.

4,108,213
METHOD AND APPARATUS FOR A WEAVING MACHINE FOR FORMING A FABRIC SELVEDGE

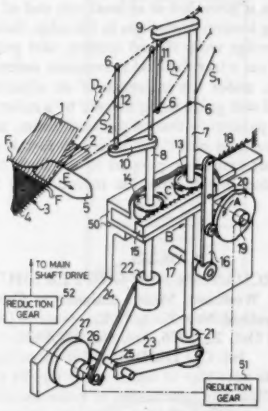
Peter Guttinger, Tann-Rüti, Switzerland, assignor to Ruti Machinery Works Ltd, Ruti, Switzerland

Filed Mar. 21, 1977, Ser. No. 779,780

Claims priority, application Switzerland, Mar. 25, 1976, 3728/76

Int. Cl.[2] D03D *47/40*

U.S. Cl. 139—54 **15 Claims**



4. An apparatus for forming a fabric selvedge on a loom with two crossing threads and two noncrossing threads, having guide eyelets for associating a crossing thread and a noncrossing thread in each case, threads D_1, S_1, and threads D_2, S_2, with one another as a pair of selvedge threads, said guide eyelets for each pair of selvedge threads being situated substantially adjacent one another, and having holding means for the guide eyelets of the crossing and noncrossing threads and with first and second driving means coupled with these holding means, the first driving means being provided for the shed forming movements of all the holding means and the second driving means for the pivoting movement of the holding means, comprising the guide eyelets of the crossing threads, characterized in that the first driving means and the second driving means are so controlled that the pivoting movement of

the holding means for the guide eyelets of the crossing threads D_1, D_2 is carried out in each case after each second shed forming movement.

4,108,214

WEAVING LOOM WITH TENSION ADJUSTOR FOR WARP EDGE THREADS

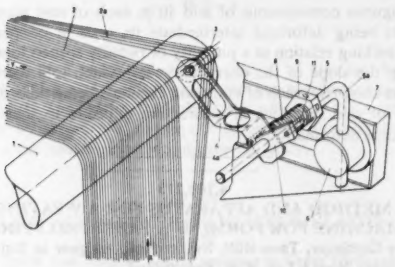
Hubert Peter van Mullekom, Deurne, Netherlands, assignor to Ruti-Te Strake B.V., Deurne, Netherlands

Filed Jan. 10, 1977, Ser. No. 758,127

Claims priority, application Netherlands, Jan. 20, 1976, 7600568

Int. Cl.² D03D *49/00*

U.S. Cl. 139—97 **2 Claims**



1. A weaving loom in which the back beam is mounted for carrying out a limited translational movement for compensating the variations in tension in the warp threads passing over it, which variations are caused by the periodic changes of the shed, characterized in that an auxiliary guide for a plurality of warp edge threads is provided at at least one end of the back beam for adjusting tension deviations in the edge threads with respect to the average warp thread tension, said guide being mounted to carry out a translational movement, independently of the back beam, under the influence of an adjustable load imparted to it, and said guide being formed by a roller, the axis of which extends parallel to that of the back beam, said roller being rotatably mounted on an arm which in turn is rotatably mounted on a shaft extending parallel to the back beam axis and is spring-loaded in the direction turned away from the back beam.

4,108,215

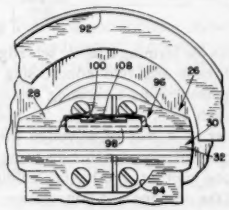
CONTROL MECHANISM FOR GRIPPER SHUTTLES

John H. Osgood, Westboro, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,142

Int. Cl.² D03D *47/24*

U.S. Cl. 139—438 **9 Claims**



1. Shuttle control apparatus for looms operating with gripper shuttles comprising:

a. a shuttle box having an elongated opening along one side thereof and at least two generally opposed elongated surfaces extending inwardly from said elongated opening for guiding a shuttle therebetween;

b. a braking member movable toward and away from said opening;

c. means for moving said braking member toward said opening for engaging and braking a shuttle which enters said shuttle box and away from said opening for disengaging from said shuttle and thereby allowing said shuttle to be picked out of said shuttle box;

d. means for positioning a shuttle to a predetermined location within said shuttle box after it has been braked; and

e. a restraining member extending along a portion of at least one of said elongated surfaces for restraining a shuttle against sliding movement between said surfaces to maintain it in said predetermined location after it has been positioned and which allows said shuttle to be picked out of said shuttle box.

4,108,216

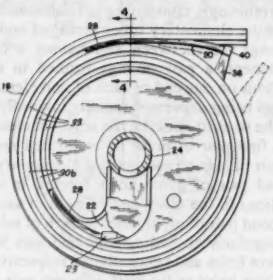
YARN DISPENSING APPARATUS FOR A LOOM AND THE METHOD THEREOF

Karl W. Wueger, Ward St., North Brookfield, Mass. 01535

Filed Nov. 11, 1974, Ser. No. 522,402

Int. Cl.² D03D *47/36*

U.S. Cl. 139—452 **19 Claims**



1. A yarn dispensing apparatus for a loom comprising:

(a) a conduit having an opening at each end thereof and a continuous opening which extends from one of said end openings to the other along one side of said conduit;

(b) a valve for sealing said continuous opening;

(c) means for creating an air flow through said conduit from one of said end openings to the other upon sealing of said continuous opening to draw a loop of yarn from a source of supply into said conduit through said one end opening; and

(d) control means for actuating said valve so that said continuous opening is alternately unsealed to allow said yarn to be withdrawn from said conduit through said continuous opening to said loom and sealed to allow an additional length of said yarn to be drawn into said conduit from said source of supply.

4,108,217

METHOD AND APPARATUS FOR FORMING AND TRIMMING LEADS

John Kellogg Westberg, II, Boulder, Colo., assignor to Formistor Corporation, Vail, Colo.

Filed Jun. 13, 1977, Ser. No. 805,762

Int. Cl.² B21F *45/00*

U.S. Cl. 140—105 **15 Claims**

1. Apparatus for forming and trimming the leads of electronic components, the apparatus comprising:

an index disc mounted for rotation around an axis and having defined in the periphery thereof indentations adapted to accomodate electronic components;

a motor;

indexing means connecting the motor to the index disc and adapted to rotate the index disc in an intermittent manner;

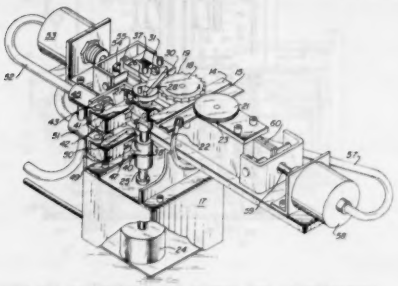
an idler disc positioned adjacent the index disc to form an interface therewith and mounted for rotation around an axis substantially parallel to the axis of the index disc;

means to lock the index disc against rotation when the index disc is not engaged for rotation by the indexing means;

first and second timing means operably connected to the motor;

first and second drive means each connected for activation by the first and second timing means, respectively;

first and second die means carried one each by the first and second drive means, the first and second die means being positioned adjacent to but axially spaced from the index disc and idler disc and adapted to converge adjacent the interface between the index disc and idler disc;



feed means adapted to supply electronic components to the interface between the index disc and idler disc;

whereby electronic components may be supplied to the index disc and accomodated in an indentation therein, intermittently advanced by the motor driving through the indexing means to the interface position between the index disc and idler disc whereupon the first and second timing means activates the first and second drive means to converge the first and second dies adjacent the index disc and idler disc interface to trim and form leads projecting from the electronic component into the path of the converging dies.

4,108,218

METHOD OF PREPARING A REACTION CHAMBER

John H. Estes, Wappingers Falls; Stanley Kravitz, Fishkill, and John T. Brandenburg, Hopewell Junction, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jun. 25, 1976, Ser. No. 699,754

Int. Cl.[2] B65B *3/04*; B01J *21/04, 23/22*

U.S. Cl. 141—1 **7 Claims**

1. The method of preparing a reaction chamber containing particulate contact medium in a gravity-packed bed having at operating temperature a solid substantially continuous phase of cooled fused-solid and a discontinuous phase of said particulate support medium, the component portions of said particulate support medium being positioned substantially uniformly through the supporting matrix of said fused solid, said cooled matrix being bonded, internally each portion to an adjacent portion, and externally to the wall of said reaction chamber, through which bed fluid passes as it contacts the surface of said contact medium at operating temperature which comprises

(a) forming a mixture containing (i) a fluid suspending medium and (ii) at least one finely-divided solid selected from the group consisting of oxides of a catalytic metal of Group V B, Group VI B, and Group VII B of the Periodic Table and compounds thermally decomposable to said oxide, which solid is fusible at temperature above said operating temperature and solid at said operating temperature;

(b) contacting said mixture and a particulate support medium thereby uniformly coating said particulate support medium with said finely-divided solid, said finely-divided solid being present in amount of a 0.1 w %–25 w % of the total of said finely-divided solid and said support medium;

(c) heating said coated particulate support medium, as a gravity-packed bed filling the inside of said reaction chamber and in contact with the walls thereof, to a temperature at least as high as the fusion temperature of said finely-divided solid whereby said finely-divided solid fuses and forms a substantially continuous matrix within which the particulate support medium is present as discontinuous phase; and

(d) quiescently cooling said fused solid to temperature below its fusion temperature thereby forming a solidified matrix, occupying the interior of said chamber and substantially fixed therein, having at operating temperature a substantially continuous solid phase of said cooled fused-solid and a discontinuous phase of said particulate support medium, the component portions of said particulate support medium being positioned substantially uniformly through the supporting matrix of said fused solid, said cooled matrix being bonded, internally each portion to an adjacent portion, and externally to the wall of said reaction chamber.

4,108,219

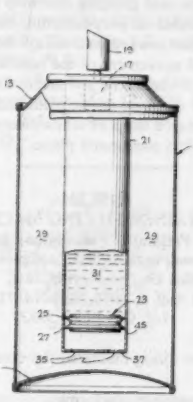
AEROSOL DISPENSER WITH INNER CONTAINER AND PISTON

Joseph Shulsinger, 26907 Indian Peak Rd., Rancho Palos Verdes, Calif. 90274

Filed May 25, 1977, Ser. No. 800,298

Int. Cl.[2] B65D *83/14*

U.S. Cl. 141—3 **4 Claims**



1. (New) A spray container comprising

a first cylinder including

a continuous side wall

a pair of end walls sealed to said side walls and,

an aerosol valve in one of said end walls

a second cylinder within said first cylinder and sealed to said one of said end walls about said aerosol valve, piston means within said second cylinder including

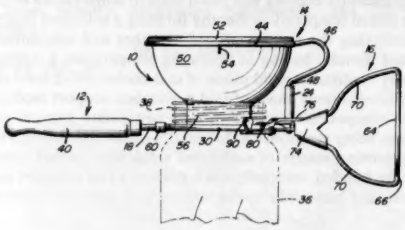
means on said piston means for forming a seal about said piston means with at least a portion of the internal surface of said second cylinder wall and having

a wall having

at least one aperture in said second cylinder wall so located as to always be on a first side of said piston means regardless of the axial position of the latter within said second cylinder at least one additional aperture in said second cylinder so located as to provide fluid communication between the volume within said second cylinder on a second side of said piston and the volume within said first cylinder but outside of said second cylinder, when said piston is

located at an axial position within said second cylinder at least a predetermined distance from said aerosol valve.

4,108,220
MULTIPLE USE CANNER
Stanley J. Pantek, 4244 Pantek Park, Attica, Mich. 48412
Filed Jun. 23, 1977, Ser. No. 809,438
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—98 **10 Claims**



1. A multiple use canner comprising a pair of elongated handle members, means pivotally interconnecting said handle members, jaw means on each of said handle members disposed in opposed relation for movement toward and away from each other, a gripping assembly forming an extension of the handle members, means detachably securing the gripping assembly to the handle members, said gripping assembly including a pair of jaw members oriented in perpendicular relation to the jaw means and movable toward and away from each other in response to pivotal movement of the handle members in relation to each other to enable the jaw means to engage a supporting structure when disposed in one plane and the jaw members to clampingly engage a support when oriented in a plane perpendicular to the first mentioned plane.

4,108,221
CONTAINER FILLING MACHINE
Gerhart William Freimuth, Flemington, and Jerold Samuel Weiner, Spotswood, both of N.J., assignors to Gerhart Engineering & Machine Co., Somerville, N.J.
Filed Aug. 6, 1976, Ser. No. 712,054
Int. Cl.[2] B65B *3/32*
U.S. Cl. 141—146 **12 Claims**

1. In a container filling machine, the combination comprising:

a plurality of container platforms;

a bulk supply tank for storing fluid;

a plurality of piston pumps each including a piston rod;

a plurality of nozzles;

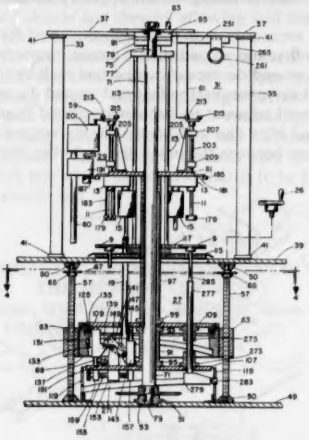
a plurality of valves, each one of said valves being associated with and having an individual piston pump and individual nozzle connected thereto, said nozzle projecting downward from said valve above a particular one of said container platforms;

means for delivering fluid from said bulk supply to said valves;

means for operating said valves to deliver fluid from said bulk supply tank into said piston pumps during a charging cycle, and from said piston pumps into said nozzles during a discharge cycle;

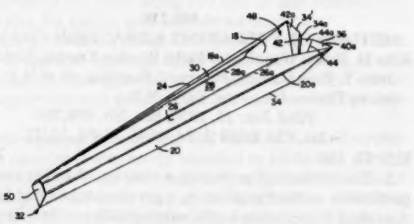
cam controlled pumping means including: a barrel-like pump actuating cam having a track; and cam follower means resting partially within and guided by said track, for providing pumping movement correspondence with the profile of said track; said cam controlled pumping means providing in combination with said valve operating means, greater than 180° of machine time for continuously discharging fluid from said nozzles during the discharge cycle; and

stroke adjusting means including: a plurality of crank levers pivotally connected between said cam follower means and individual ones of said piston rods of said piston pumps,



respectively; and means for controlling the pivoting of said plurality of crank levers for providing infinite adjustability in a range between zero and maximum stroke of the stroke of said piston pumps without necessitating changing of the profile of said pump actuating cam.

4,108,222
COLLAPSIBLE DISPOSABLE FUNNEL
George Kaufman, North Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.
Filed Dec. 27, 1976, Ser. No. 754,530
Int. Cl.[2] B65B *39/00*; B67C *11/02*
U.S. Cl. 141—337 **5 Claims**



1. A collapsible funnel comprising a body portion and a moveable dam forming an integral part of said body portion, said body portion having a cross section defined perimetrically by two bottom panels separated by a fold line extending longitudinally along said panels and being folded along said fold line into a V-shaped disposition at the lower portion of said cross section, said bottom panels subtending and connecting with multiple panel walls arranged in polygonal disposition at the upper portion of said cross section to provide a fluid inlet on one end of said connected multiple wall panels adjacent said dam, a fluid outlet on the opposite end of said connected panels, said connected panels remote from said dam defining an enclosed fluid passageway for said funnel leading from said fluid inlet to said fluid outlet, said dam being formed into a movable vertically disposed wedge-like configuration by a series of fold lines having a common vertex along said bottom

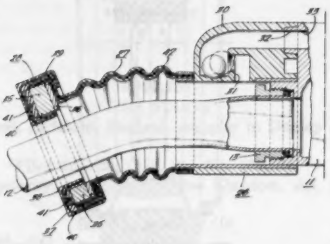
panel fold line, forward and rearward movement of said dam being accomplished by application and release of pressure respectively against the side edges of said funnel.

4,108,223

VAPOR RECEIVING SYSTEM FOR A DISPENSING NOZZLE

William B. Hansel, Media, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed Mar. 8, 1976, Ser. No. 664,445
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—392 **24 Claims**



1. A vapor receiving system for use on a dispensing nozzle having a housing and a discharge spout, the vapor receiving system being designed to receive the vapors displaced through the fillpipe from the tank being filled and to be in fluid communication with a recepticle for receiving the vapors displaced from the tank, the vapor receiving system comprising:

(a) means defining a vapor receiving chamber surrounding the discharge spout of the nozzle and having one end for connection to the nozzle housing;

(b) a sealing section connected to the other end of the vapor receiving chamber and having a sealing face for meeting the fillpipe opening; and

(c) means for covering the sealing face of the sealing section so that a tight seal is obtained between the fillpipe and the sealing face, said covering means including,

(i) reinforcement means, and

(ii) flexible material impregnating the reinforcing means to form a thin, smooth flexible layer wherein the reinforcement means in the flexible material enables maximum strength and flexibility to be imparted to the covering means to increase the probability of obtaining a tight seal between the sealing face and the fillpipe.

4,108,224

TREE SHEAR TILTING MECHANISM

Leon A. Wirt, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 13, 1976, Ser. No. 731,966
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—34 E **15 Claims**

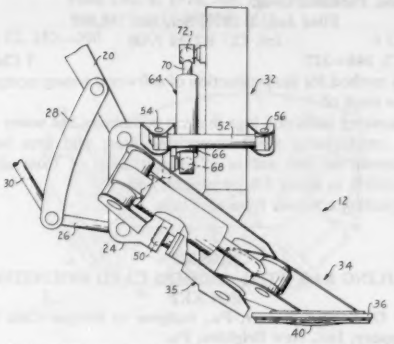
1. A mounting apparatus for a tree shear mechanism of a vehicle, said tree shear mechanism comprising a frame and shear means operatively mounted thereto, said mounting apparatus comprising:

a body;

means mounting the body to the vehicle;

pivot means interconnecting the body and frame of the tree shear mechanism for providing pivoting of the frame and shear means relative to the body generally about a longitudinal axis of the vehicle;

link means interconnecting the body and frame for guiding movement of the frame as the frame is pivoted relative to



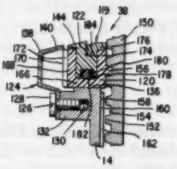
the body about the longitudinal axis of the vehicle through the pivot means interconnecting the body and frame; and means for so pivoting the frame relative to the body.

4,108,225

DEPTH-OF-CUT MECHANISM FOR ROUTERS

Charles Edward Hestily, Greenville, S.C., assignor to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 736,916, Oct. 29, 1976, Pat. No. 4,051,880. This application May 12, 1977, Ser. No. 796,507
Int. Cl.[2] B27C *5/10*
U.S. Cl. 144—134 D **4 Claims**



1. A portable electric router comprising:

(a) a base having an open top and a flat bottom defining a reference plane,

(b) a motor housing having a threaded section slidably received in the base, and free to move vertically, but restrained from rotation therein,

(c) a motor journaled in the motor housing and carrying a bit at its lower end,

(d) a pointer fixedly connected to the base adjacent the open top thereof and extending radially outwardly therefrom,

(e) a ring member including an outer ring within which an inner ring is entrapped,

(f) the ring member being nestable upon the open top of the base,

(g) the outer ring being threadedly connected to the motor housing,

(h) the inner ring having calibrated outward extension, and

(i) the inner ring being selectively rotative independently of, or in combination with the outer ring relative to the pointer to permit vertical adjustment of the motor housing to a predetermined depth-of-cut of the bit relative to the reference plane.

4,108,226

VENEER PRODUCTION

L. F. Bornstein, Atlanta, Ga., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Jan. 3, 1977, Ser. No. 758,908

Int. Cl.[2] B27M *1/06*

U.S. Cl. 144—327 **7 Claims**

1. A method for the production of softwood veneer comprising the steps of:

(a) soaking softwood logs in a vat containing hot water and a conditioning agent comprising urea; said urea being present in said vat in a concentration of from about 0.003% to about 2% by weight; and

(b) peeling a veneer from said logs.

4,108,227

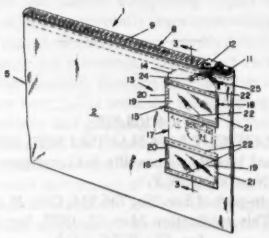
MAILING BAG WITH ADDRESS CARD MOUNTING POCKET

Cletus D. Bonner, Beaver, Pa., assignor to Strayer Coin Bag Company, Inc., New Brighton, Pa.

Filed Dec. 29, 1977, Ser. No. 865,737

Int. Cl.[2] A45C *13/42*

U.S. Cl. 150—15 **6 Claims**



1. A bag for carrying mail or the like comprising two overlying panels of similar size and shape secured along their two peripheral sides and bottom edges to form a main pocket therebetween, said top edges being unsecured to provide a mouth, a slide fastener connected to said panels along said top edges for opening and closing said main pocket mouth, a card pocket including spaced upper and lower sections covered with transparent material and an exposed open mid portion therebetween, an address card removably inserted beneath said pocket sections and having spaced upper and lower address portions thereon and a blank mid portion therebetween whereby said addresses are covered by said transparent material and said exposed mid portion is accessible for receiving and cancelling postage.

4,108,228

VEHICLE WHEEL WITH RUBBER TIRE

Reinhard Tiemann, Hemmingen, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed Nov. 26, 1975, Ser. No. 635,662

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456420

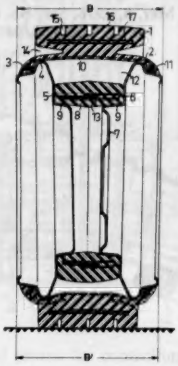
Int. Cl.[2] B60B *9/10*

U.S. Cl. 152—7 **11 Claims**

1. In combination:

a vehicle wheel comprising a split rim having separate independent rim discs without rigid connection to each other, each rim disc having lateral wheel flanges axially spaced from each other for receiving tire beads radially outwardly thereon and also having rim extensions respectively connected to and directed radially inwardly from said wheel flanges and defining with each other an annular space extending radially inwardly therebetween with regard to the largest diameter surface of said wheel flanges;

a solid rubber tire having beads resting radially on the axial outside of, and held respectively by, said lateral wheel flanges, said wheel flanges exerting outwardly directed axial forces upon said beads by means of spring tension, and said tire exerting inwardly directed axial forces on said rim discs, said tire extending across said annular space and being adapted to be partially deflected thereinto during springing-in of said tire; and



additional intermediate coaxial means located between said rim discs and radially inwardly between said wheel flanges for supporting and detachably connecting said rim discs and for resisting said inwardly directed axial forces of said tire, said solid rubber tire and said additional intermediate coaxial means being individual parts which are assembled together safely under tensile and pressure forces into a functional unit without the necessity of any bonding connections, said tire and said coaxial means being suitably capable of being taken apart again for interchange and replacement purposes.

4,108,229

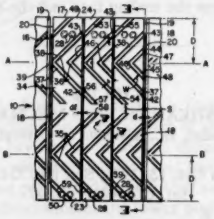
TRACTION ELEMENT FOR REMOVABLE TRACK

Eugene T. Herman, Saint Marys, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,433

Int. Cl.[2] B60C *11/00*

U.S. Cl. 152—175 **4 Claims**



1. A track for an annular resilient tire comprising a flexible belt, a plurality of substantially rigid elongated shoes extending transversely of said belt and being mounted on said belt at spaced-apart positions along said belt, each of said shoes having a belt-engaging surface, a ground-engaging surface, a leading edge, a trailing edge and end edges, substantially rigid raised traction bars on said ground-engaging surface, all of said bars being in groups at spaced-apart positions transversely of said belt on said ground-engaging surface or being supplemen-

tary separate traction bars, each of said groups having a pair of bars positioned at acute angles to said leading and trailing edges with said pair of bars extending from first spaced-apart positions on said ground-engaging surface at said trailing edge to a single position on said ground-engaging surface at said leading edge, each of said groups having a second pair of traction bars in substantially parallel relationship to said pair of traction bars and extending from spaced-apart positions on said trailing edge located between said first-mentioned spaced-apart positions on said trailing edge to an intermediate position between said leading and trailing edges and said supplementary traction bars extending from said leading edge and in substantial alignment with at least some of said bars of said groups so that the spaces between all of said bars are open at said trailing edge for passage of earth and cleaning of said shoes during operation.

4,108,230
TIRE STUDS

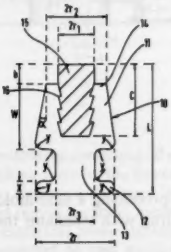
Robert Bond, Lichfield, England, assignor to Dunlop Limited, England

Filed Jun. 28, 1976, Ser. No. 700,526

Claims priority, application United Kingdom, Jul. 5, 1975, 28455/75

Int. Cl.[2] B60C *11/14*

U.S. Cl. 152—210 **1 Claim**



1. A tire stud having a body of circular cross-section with a maximum radius r of 0.00275 meter ± 0.0005 meter, said body having a tip portion embedded in one end of said body and protruding above said body by a distance b of 0.00125 meter ± 0.00025 meter, said tip portion having a circular cross-section with a radius r_1 of 0.0015 meter ± 0.0002 meter, said stud having an overall length L of 0.010 meter ± 0.0005 meter, and being dimensioned such that the expression

$$\frac{a_1(a_2 + a_3)a_4}{(a_5 + a_6 + a_7)}$$

lies between the limits 3.3×10^5 and 8.2×10^5 where:

$$a_1 = \frac{31.831}{(r_1)^2}$$

$$a_2 = 67468.8r$$

$$a_3 = \frac{0.0705221r}{(b + 0.00043)^2}$$

$$a_4 = (7000.0b + 3.0)r^2$$

$$a_5 = 21476.0r(0.015 + b - L)$$

$$a_6 = 7560117.0r^2(b + 0.00043)$$

$$a_7 = \frac{0.02245r(0.015 + b - L)}{(b + 0.00043)^2}$$

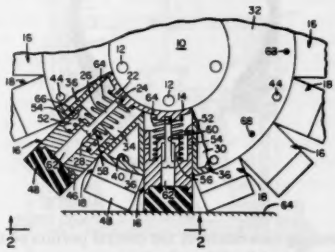
4,108,231
VEHICLE WHEEL

Leonard J. Holchuk, 2053 Lake St., Elmira, N.Y. 14901

Filed Oct. 6, 1976, Ser. No. 730,205

Int. Cl.[2] B60C *7/18*

U.S. Cl. 152—290 **6 Claims**



1. A vehicle wheel comprising

a hub,

first and second equally-sized, spaced, coaxial disks, said first disk surrounding said hub and being coplanar therewith,

a first plurality of triangularly shaped members disposed between said first and second disks and being secured thereto, each of said first plurality of members having two identical opposed planar rectangular walls which are secured together at one edge thereof,

a first right circular cylinder which is coaxial with said hub, a first end of said first cylinder being secured to said hub and said first disk, the end of said first cylinder opposite said first end being secured to said second disk, said one edge of said two planar walls of each of said first plurality of members being affixed to said first cylinder, said first plurality of triangularly shaped members being equally spaced around said first cylinder, the space between each of the adjacent ones of said first plurality of members forming along with the adjacent portions of said first and second disks a first plurality of equally spaced chambers, the opposite walls of each chamber being parallel,

a first plurality of feet, one of said feet being disposed in each of said first plurality of chambers and being capable of radial movement, that portion of each of said feet nearest said first cylinder having at least one cavity therein,

means for restricting movement of each of said feet beyond a predetermined distance from said first cylinder so that those portions of said feet remote from said first cylinder tend to lie in a substantially circular arc, and

at least one spring disposed between each of said feet and said first cylinder, one end of each spring being fixedly mounted with respect to said first cylinder, the other end of each spring being disposed within its respective cavity.

4,108,232
SHIELD FOR SEALING A TUBELESS TIRE ON A SPOKED WHEEL RIM

Robert O. Simpson, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 28, 1976, Ser. No. 736,686

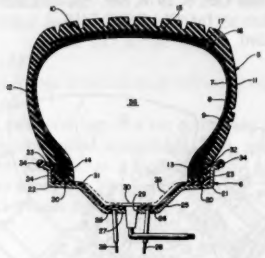
Int. Cl.[2] B60C *5/08*

U.S. Cl. 152—365 **2 Claims**

1. A shield for sealing openings in a U-shaped well formed in the cylindrical base of a conventional, spoked wheel rim on which a conventional tubeless tire is mounted, comprising:

(a) a generally cylindrical fluid impervious, elastic annulus dimensioned to at least cover the base between flanges of the wheel rim; and

(b) transversely extending folds arcuately spaced centrally of the annulus at a position to cover the U-shaped well for



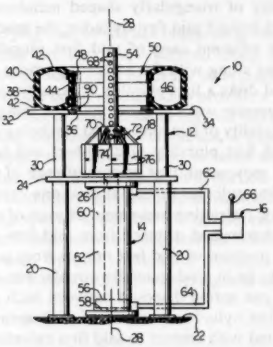
controlling movement of the central portion of the annulus into the well of the wheel rim.

4,108,233

TIRE AND CENTER SUPPORT ASSEMBLING APPARATUS

Terry G. Baer, Edelstein, and Wayne A. Klopfenstein, Princeville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 30, 1977, Ser. No. 782,670
Int. Cl.[2] B60C *25/06*
U.S. Cl. 157—1.37 **7 Claims**



1. A tire and center support assembling apparatus, for installing a split rim into a tire, comprising:

a tire supporting frame having a central axis;

a powered actuator connected to the frame and having a movable element; and

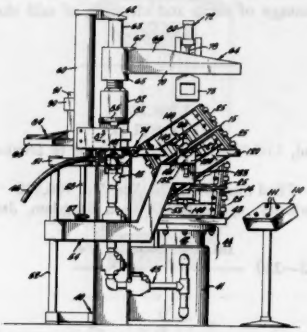
shoe assembly means for expanding the rim into a preselected interference fit position within the tire in response to selective movement of the element of the actuator along the axis, the shoe assembly means having a plurality of similar shoes individually having a radially outer cylindrical surface portion and linkage means for radially moving and expanding each of the shoes in a plane perpendicular to the central axis into engagement with the rim while maintaining the outer cylindrical surface portions collectively in generally concentric and aligned relation with the central axis, the linkage means being connected to the movable element.

4,108,234

METHOD AND MACHINE FOR PRODUCING SAND MOLDS

Thomas R. Shine, 782 Richards Rd., Wayne, Pa. 19087

Filed Apr. 19, 1977, Ser. No. 788,813
Int. Cl.[2] B22C *17/00, 17/08*
U.S. Cl. 164—38 **2 Claims**



1. The method of producing a sand mold in a flask assembly having a cope and drag with trunnions thereon, and a matchplate, comprising:

a. supporting the flask assembly drag up with sand in the drag;

b. jolting the flask assembly to settle the sand within the drag;

c. placing a bottom board on top of the drag sand;

d. vertically picking up the flask assembly at the trunnions and rolling the flask assembly over to place the flask assembly in a cope-up position, and lowering the flask assembly vertically back down, to receive sand within the cope;

e. filling the cope with sand;

f. squeezing the sand within the flask assembly;

g. vertically raising the flask assembly to an upper position, and retaining the cope by means of the cope trunnions, with the squeezed sand therein, at said upper position;

h. lowering, in a vertical direction only, the drag, with the squeezed sand therein, and the matchplate, to a position below the cope;

i. removing the matchplate from the drag and swinging it to one side of the drag;

j. vertically raising the drag and sand therein up to the cope to reunite the drag to the cope to form the completed sand mold;

k. vertically lowering the cope and drag and sand mold therein to a lower position; and

l. opening the cope and drag flasks and raising vertically the cope and drag flask to an upper position, while allowing the sand mold to remain at the lower position, wherein all movements of the cope and drag are limited to vertical movement only.

4,108,235

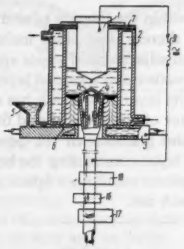
ELECTROSLAG REMELTING APPARATUS HAVING RELATIVE MOLD MOVEMENT AND PROVISION FOR INTRODUCTION OF SLAG

Boris Evgenievich Paton, ul. Kotsjubinskogo 9, kv. 21; Boris Izrailevich Medovar, Bulvar Lesi Ukrainki 2, kv. 8; Jury Vadimovich Latash, Vozdukhoflotsky prospekt 87, kv. 14; Leonty Vasilievich Chekotilo, ulitsa Scherbakova, 49-a, kv. 10; Vitaly Mikhailovich Baglai, ulitsa Semashko 10, kv. 54/3; Viktor Leonidovich Artamonov, ulitsa Sovetskaya 9, kv. 4; Rodimir Ivanovich Garkaljuk, ulitsa Bolshaya, kitaevskaya, 142 korpus 14, kv.33; Viktor Anatolievich Timchenko, ulitsa Vladimirskaya 98/3, kv. 36; Evgeny Fedorovich Malichenko, prospekt Entuziastov 7/12, kv. 161; Leonid Mikhailovich Stupak, Brest-Litovsky prospekt 39, kv. 9, and Rudolf Solomonovich Dubinsky, Brestlitovsky prospekt 11, kv. 15, all of Kiev, U.S.S.R.

Continuation of Ser. No. 124,836, Mar. 16, 1971, abandoned, which is a division of Ser. No. 771,165, Oct. 28, 1968, abandoned. This application Sep. 17, 1974, Ser. No. 506,719

Int. Cl.[2] B22D *27/02*

U.S. Cl. 164—252 **37 Claims**



1. A device for electroslag remelting of metal comprising: a mold defining a remelting zone by the lower portion thereof: at least one consumable electrode disposed in said mold with its lowermost end in said remelting zone; means connected to said device for applying electrical power to said electrode to melt the same: means connected to said mold for supporting, enabling and controlling axial movement of said mold during remelting; means engaging said electrode and for supporting and controlling movement of said electrode: a cooled core disposed at least in part inside of said mold for forming an internal cavity in the ingot being built-up from said consumable electrode; and means for introducing molten slag to said remelting zone including a slag conducting aperture located in the structure of said mold lower portion.

4,108,236

FLOATING HEAT INSULATING BAFFLE FOR DIRECTIONAL SOLIDIFICATION APPARATUS UTILIZING LIQUID COOLANT BATH

Richard W. Salkeld, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

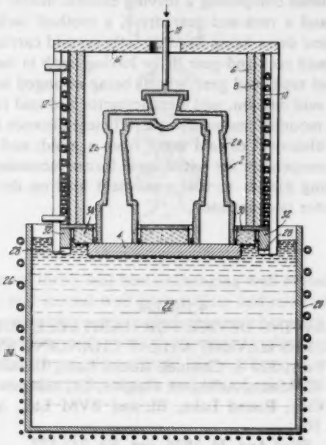
Filed Apr. 21, 1977, Ser. No. 789,752

Int. Cl.[2] B22D *27/04*

U.S. Cl. 164—338 R **6 Claims**

1. In a casting apparatus for the directional solidification of molten metal wherein the apparatus includes a heating furnace having an open end through which a heated mold containing molten metal is withdrawn, a liquid cooling bath positioned beneath the open end of the furnace and means for gradually withdrawing the heated mold from the furnace, through the open end and immersing it in the cooling bath, the improvement comprising:

a heat insulating baffle positioned between the open end of the furnace and the liquid cooling bath, the baffle being constructed to have a density less than that of the liquid coolant so that it floats on the bath surface during the solidification process, the baffle having at least one opening therethrough aligned beneath the open furnace end to permit mold withdrawal from the furnace, through the baffle and into the cooling bath, the baffle surrounding the mold as it is withdrawn toward the cooling bath to minimize heat loss therefrom until the mold is immersed, said



minimization of heat loss substantially improving the thermal gradient in the mold, said floating baffle also reducing vaporization of the liquid coolant during mold withdrawal and providing a smooth bath surface for uniform cooling.

4,108,237

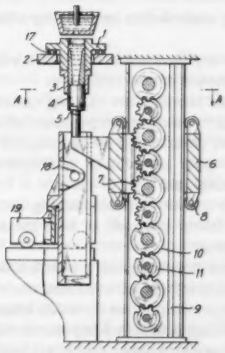
MACHINE FOR SEMICONTINUOUS CASTING OF METALS

Mikhail Yakovlevich Brovman, ulitsa N.Kurchenko, 12, kv. 22; Ivan Konstantinovich Marchenko, ulitsa Lenina, 6, kv. 94; Nikolai Mikhailovich Kozy, ulitsa Parkovaya, 45, kv. 78; Ilya Lukyanovich Veligura, ulitsa B.Khmelnitskogo, 15, kv. 21; Ivan Fedorovich Bairakov, ulitsa Shmidta, 28, kv. 1, all of Kramatorsk; Evgeny Tikhonovich Dolbenko, ulitsa Garibaldi, 10, kv. 93, Moscow; Jury Evgenievich Kan, Ananievsky pereulok, 7/14, kv. 49, Moscow, and Abram Vladimirovich Leites, Simferopolsky bulvar, 29, kv. 2-131, Moscow, all of U.S.S.R.

Filed Mar. 18, 1977, Ser. No. 779,083

Int. Cl.[2] B22D *11/08*

U.S. Cl. 164—425 **5 Claims**



1. A machine for semicontinuous casting of metals, comprising: a mold; a frame on which said mold is mounted; a vertical

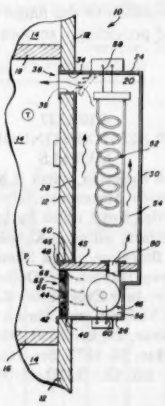
guide column arranged parallel to the withdrawal axis of an ingot near the mold; a carriage mounted movably along said vertical column and carrying a dummy bar on a cantilevered end extending to the mold; means for withdrawing said ingot from the mold and for driving the carriage with said dummy bar, said means comprising a driving electric motor, a reduction gear and a rack-and-gear drive, a toothed rack of said rack-and-gear drive being fixed directly on said carriage, gear wheels of said rack-and-gear drive having teeth in mesh with teeth of said rack, said gear wheels being arranged in succession along said column, said electric motor and said reduction gear being mounted stationary at a sufficient distance from the zone of withdrawal of said ingot from a mold; and braking means to compensate for withdrawal forces increasing as the ingot is being drawn, so that a constant load on the driving electric motor is maintained.

4,108,238

ENERGY SAVING DEVICE FOR HABITABLE BUILDING ENCLOSURES HAVING A HEAT CHANGING SYSTEM

Robert F. Vary, 320 S. Channel, Round Lake, Ill. 60073, and Anthony C. Mamo, Arlington Heights, Ill., assignors to Robert F. Vary, Round Lake, Ill. and BVM Ltd., Arlington Heights, Ill.

Filed Aug. 24, 1976, Ser. No. 717,177
Int. Cl.² F28F *27/02;* F24H *9/02, 9/08;* F28F *9/22*
U.S. Cl. 165—57 **16 Claims**



1. In a building construction embodying a habitable enclosure,

a temperature varying system for maintaining a predetermined temperature in said enclosure,

a housing for said temperature varying system which housing is exposed to outdoor temperature influences,

an upper register constituting an opening for passage of air between the upper portions of said habitable enclosure and said housing, and

a lower register constituting an opening for passage of air between the lower portions of said habitable enclosure and said housing,

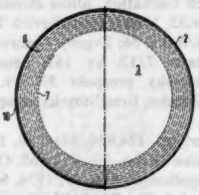
the improvement consisting of a uni-directional non-rigid flap valve means interposed in at least one of said registers to allow passage of air in one direction when the air in said enclosure is being desirably temperature adjusted by said temperature varying system, and to prevent passage of air in the opposite direction when the air in said enclosure is being undesirably temperature adjusted due to outdoor temperature influence.

4,108,239

HEAT PIPE

Paul Fries, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 22, 1976, Ser. No. 668,929
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1975, 2515753
Int. Cl.² F28D *15/00*
U.S. Cl. 165—105 **8 Claims**



1. A heat pipe adapted to carry an evaporable working fluid comprising:

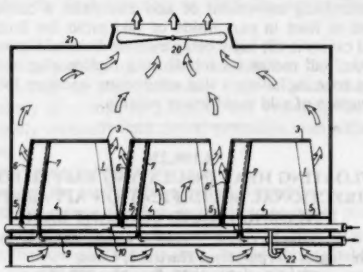
a wick disposed within the interior of said pipe so as to form a vapor space therein, said wick including a first layer which is situated adjacent said vapor space and which has a small-pore structure and a second layer which is situated adjacent said first layer and which has a large-pore structure, the diameter of the pores of said first layer being less than one-half the diameter of the pores of said second layer, said first layer constituting the boundary surface of said second layer to said vapor space and being a single layer of fine mesh net.

4,108,240

HEAT EXCHANGER SYSTEM

Peter Heinrich Erwin Margen, and Rolf Paul Näslund, both of Nyköping, Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Apr. 29, 1976, Ser. No. 681,471
Claims priority, application Sweden, May 7, 1975, 7505362
Int. Cl.² F28D *7/00;* F28F *9/22*
U.S. Cl. 165—125 **9 Claims**



1. A heat-exchanger system for heat-exchange between a gas and a liquid comprising:

(a) a base plate;

(b) a plurality of plastic tube coil units tightly packed and mounted on said base plate, each of said coil units comprising a length of plastic tubing wound to form said coil, the windings of said coil units being slightly spaced, said coil units having open ends and a hollow interior and wound to present a frusto-conical profile, said frusto-conical coil unit having a larger base and a smaller base, said base plate having an opening therein aligned with and corresponding to the size and shape of the open end of said larger base of said coil unit adjacent thereto;

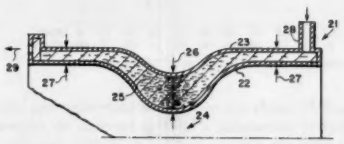
(c) closure means covering the open end of said smaller base of said coil unit opposite to that on the base plate;
(d) means in said closure means for causing gas to flow through the interior of said coil unit windings in a direction generally perpendicular to the conical surface of said coil unit; and
(e) separate delivery and return means connected to the ends of said tubes for delivering and withdrawing liquid, respectively, from said coils.

4,108,241

HEAT EXCHANGER AND METHOD OF MAKING

Anthony Fortini, Cleveland, and John M. Kazaroff, Rocky River, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,846
Int. Cl.[2] F28F *13/00*
U.S. Cl. 165—146 **5 Claims**



1. A Heat exchanger for transferring heat from an environment at one temperature to a heat-transfer fluid or vice-versa, said fluid being supplied from a heat-transfer fluid source, said heat exchanger comprising:
a chamber formed of a metal having high thermal conductivity and having an inlet and an outlet,
a porous metal matrix of high thermal conductivity disposed in said chamber, said porous matrix being metallically bonded to said chamber; all points of contact within said metal matrix being metallically bonded; and
means for directing a heat-transfer medium into said inlet, said heat-transfer medium flowing through said chamber and exhausting through said outlet, said chamber and said porous media having a greater cross-sectional area at areas of high heat exchanger than at positions of low heat exchange, and wherein both the density of said porous metal matrix and the cross-sectional area of said chamber vary along the direction of coolant flow in said chamber in proportion to the variation of heat flux of said chamber along the direction of coolant flow.

4,108,242

JET IMPINGEMENT HEAT EXCHANGER

Edward F. Searight, Harvard, and Paul Flanagan, Lexington, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 165,568, Jul. 23, 1971, abandoned. This application Feb. 7, 1973, Ser. No. 330,348
Int. Cl.[2] F28F *13/12*
U.S. Cl. 165—164 **4 Claims**

1. A heat exchanger comprising:
(a) a rigid, corrugated, imperforate plate forming a heat exchanging wall; and
(b) a second rigid plate fixedly mounted relative to said imperforate plate, forming a second wall spaced from and confronting said heat exchanging wall and forming a plenum chamber along the side thereof opposite said heat exchanging wall for confining fluid under a pressure exceeding the pressure between said heat exchanging wall and said second wall, said second wall forming a plurality of openings in substantially parallel rows for directing jets of said fluid against said heat exchanging wall and otherwise being imperforate, said openings in rows being aligned opposite the portions of the corrugations in said heat exchanging wall where the gap between walls is minimum and spaced from said portions of the corrugations for establishing a ratio (x/d) of the distance (x) separating an opening from said heat exchanging wall to the minimum width (d) of the opening not substantially in

excess of three, said heat exchanging wall extending away from said second wall intermediate said rows of openings for establishing a relatively large space between said walls intermediate said rows of openings to permit passage of said fluid from adjacent said heat exchanging wall with a minimized interference to said jets of said fluid.

4,108,243

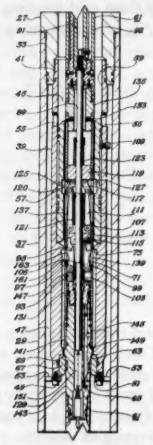
APPARATUS FOR TESTING EARTH FORMATIONS

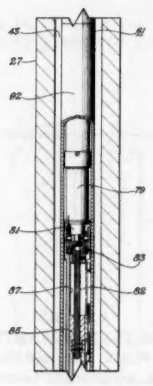
David W. King, Fort Worth, Tex., and Emmitt Edward Rankin, Aberdeen, Scotland, assignors to Gearhart-Owen Industries, Inc., Forth Worth, Tex. and Petro-Data C.A., Caracas, Venezuela

Filed May 27, 1977, Ser. No. 800,903
Int. Cl.[2] E21B *49/00, 43/00*
U.S. Cl. 166—66 **14 Claims**

1. Apparatus for concurrent surface indication of an earth formation characteristic during a drill stem testing operation, comprising:
a. a bypass sub to be disposed in a wellbore above the formation to be tested and to be connected to conduit means for communicating fluids via said bypass sub from said formation to aboveground equipment; said bypass sub having a bore extending throughout its length, with said bore having a bypass portion adapted for removably receiving a wireline tool in sealing engagement with said bore, bypass passage means communicating with said bore via upper port means disposed at the upper region of said bypass portion and lower port means disposed at the lower region of said bypass portion; said bypass sub further including sleeve valve means for selectively opening and closing said upper port means;
b. releasable packer means for permitting fluid flow from the formation to be tested to said bypass sub but otherwise isolating formation fluid below said packer means from wellbore fluids above said packer means;
c. a wireline tool to be removably received by said bore

bypass portion and including an earth formation characteristic sensor device; and





d. means incorporated in said wireline tool for selectively actuating said sleeve valve means while said wireline tool is in place in said bypass sub.

4,108,244

NATURAL GAS RECOVERY METHOD

Charles F. Cook, and George E. Hays, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 3, 1977, Ser. No. 803,100
Int. Cl.[2] E21B *43/20*
U.S. Cl. 166—268 **7 Claims**

1. In the recovery of hydrocarbon gases enriched with methane from underground natural gas reservoirs having high values of CO_2/CH_4 ratio, the step of injecting at least 500 pounds water per 1,000 cubic feet of relatively CO_2-free methane recovered into said reservoir to flood the reservoir and solubilize CO_2 present in the reservoir in the flood water to produce from said reservoir an enriched gas having a higher CH_4/CO_2 ratio than originally present in said reservoir.

4,108,245

WELL CABLE STOP FOR STRIPPING OPERATIONS

Lucien J. Babineaux, 734 N. Main St., St. Martinville, La. 70582

Filed Aug. 25, 1977, Ser. No. 827,783
Int. Cl.[2] E21B *31/10*
U.S. Cl. 166—301 **8 Claims**

1. In combination, a sleeve assembly for disposition about a stuck tool support cable immediately above a tubing string supported overshot passed downwardly over said cable during a stripping operation, said sleeve assembly including inwardly retractable outwardly projecting abutment means for engagement with the overshot and support of said sleeve assembly therefrom, and an abutment assembly for removable secure attachment to said cable adjacent the upper end thereof, said sleeve and abutment assemblies including upper and downwardly facing abutment surfaces, respectively, engageable with each other to stop and thereby limit a downward movement of said abutment assembly in the event the cable is dropped and the latter and the abutment assembly fall during the stripping operation, thereby catching the dropped cable by the engagement of the abutment assembly thereon with the overshot supported sleeve assembly and enabling the dropped cable and abutment assembly to be retrieved when the tubing string is pulled from the associated well.

8. The method of preventing accidental loss of a stuck tool support cable down a well bore during a "stripping" operation wherein a tubing string is lowered down into the bore over the cable with a tubular overshot supported from its lower end for engagement with the stuck tool, whereby the tool may be freed and upwardly retrieved with the tubing string to the surface, said method including supporting a tubular stop sleeve from within the overshot through which the cable is freely slidable, and mounting an abutment on the upper end portion of the cable against shifting therealong and with the abutment of a size sufficiently small to freely receive said tubing sections thereover and yet sufficiently large to prevent its passage through said tubular stop sleeve.

4,108,246

CONVERTER TYPE SCALE REMOVER

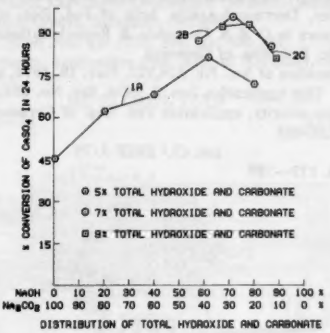
Loyd W. Jones, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 22, 1977, Ser. No. 770,728
Int. Cl.[2] E21B *43/27, 43/28*
U.S. Cl. 166—312 **6 Claims**

1. A process for removing scale containing calcium sulfate from a well, said process comprising:

(a) introducing into said well an aqueous solution of a gluco-

nate, hydroxide, and carbonate compounds, the cations of said compounds being selected from the group consisting of sodium, potassium, and ammonium, the weight ratio of hydroxide to carbonate being between the number 3:2 to about 5:1, the weight ratio of gluconate to combined hydroxide and carbonate being between 2:1 to about 5:1, the concentration of the combination of gluconate, hydroxide and carbonate being between about 15% and 50% by weight, to convert at least a substantial proportion of said calcium sulfate to an acid-soluble reaction product; and thereafter



(b) contacting said reaction product with an aqueous acid solution thereby removing said acid-soluble reaction product.

4,108,247

FIRE SPRINKLER HEAD

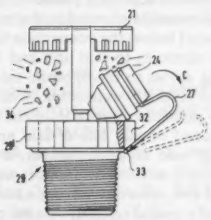
Johann Georg Mohler, Laugneri, Weggis, Switzerland (CH 6353)

Filed Jan. 25, 1977, Ser. No. 762,557

Claims priority, application Switzerland, Jan. 30, 1976, 1162/76

Int. Cl.[2] A62C *37/14*

U.S. Cl. 169—38 **3 Claims**



1. A fire sprinkler head which is mountable in a standing, suspended or horizontal position and includes:

a nozzle head;

a deflector plate;

support means connecting the deflector plate to the nozzle head and including at least two support elements fastened to the edge of the deflector plate;

a closure element seated sealingly over the mouth of the nozzle, the closure element having a groove at its perphery;

a trigger element which exerts a closing force on the closure element and is actuable to remove the closing force to leave the closure element free to move clear of the nozzle mouth to allow a jet of water to emerge; and

a length of spring wire which is substantially straight when in an unstressed condition and is mounted so that it lies in said groove tangentially against the periphery of the closure element and also against the perpheries of said support elements thereby to apply a biasing force to the closure element, so that when the closure force is removed and the closure element moves clear of the nozzle mouth, the spring wire, aided by the propulsive force of the water jet, urges the closure element clear of the region of the water jet.

4,108,248

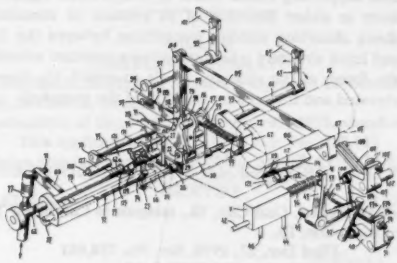
DRAFT AND POSITION CONTROL LINKAGE WITH DEPTH LIMIT FOR A TRACTOR

Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 643,584, Dec. 22, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,551

Int. Cl.[2] A01B *63/112*

U.S. Cl. 172—9 **12 Claims**



10. A control system for a tractor or the like having draft link means vertically shiftable between raised and lowered positions, and signal responsive means operable to either raise, maintain, or lower the draft link means; said control system including:

manually operable draft control means capable of transmitting a desired draft load command signal to said signal responsive means;

draft feedback means including draft load sensing means, said draft feedback means being capable of transmitting a draft feedback signal to said signal responsive means; and

variable position feedback means;

characterized by said variable position feedback means being incapable of moderating the draft feedback signal during a portion of the movement of the draft link means between a fully raised position and an intermediate position and further by being capable of moderating the draft feedback signal as the draft link means move between said intermediate position and a fully lowered position.

4,108,249

AGRICULTURAL IMPLEMENT WITH CONSTANT FRAME ATTITUDE MAINTAINING MECHANISM

Carl M. Anderson, Claremore, Okla., and Robert L. Poland, Kewanee, Ill., assignors to Chromalloy Farm and Industrial Equipment Co., Kewanee, Ill.

Filed Jul. 1, 1977, Ser. No. 812,321

Int. Cl.[2] A01B *59/04*

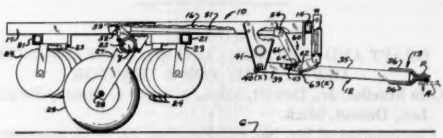
U.S. Cl. 172—328 **16 Claims**

1. In an agricultural implement which comprises a tool supporting frame having a tractor hitch structure hinged to one end thereof for relative vertical movement of the hitch structure about a transverse axis and a transversely extending rockshaft spaced from said transverse axis to which ground engaging wheels are fixed in offset relation to the axis of the rockshaft on which it turns to vertically adjust the wheels and thereby elevate and lower the frame, the improvement wherein,

a lever is pivotally connected to the hitch structure in offset

relation to said transverse axis for fore and aft movement of the lever;

a fore and aft extending rigid link having one end pivotally connected to the rockshaft in offset relation to the axis on which it turns has its opposite end pivotally connected to said lever; and



a spring-loaded link connected between the lever and the tool supporting frame reacts in compression against the lever in either direction of its rotation to constitute a shock absorbing yielding connection between the frame and hitch structure while enforcing a constant attitude of the frame at the different levels to which the frame is elevated and lowered by rotation of the rockshaft.

4,108,250

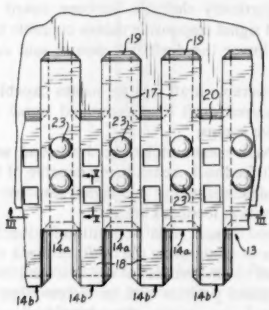
CUTTING EDGE ASSEMBLY FOR EARTHWORKING DEVICES

Russell D. Merkel, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 27, 1976, Ser. No. 754,641

Int. Cl.[2] E02F 9/28

U.S. Cl. 172—719 **14 Claims**



1. A cutting edge assembly detachably secured to the earthworking surface of an earth moving device, said assembly comprising:

several long, narrow, cutting edge members, each of said members having a body with a cutting edge, and with parallel longitudinal marginal portions of reduced thickness so that said body has a first face of one width and an opposite narrower second face, and all of said cutting edge members being mounted on the front marginal portion of the earthworking surface of said device with said longitudinal marginal portions of adjacent members in abutting side-by-side lapped relationship, and said cutting edge members occupying effectively the entire front marginal portion of said earthworking surface;

and means impaling the ones of said marginally lapped cutting edge members which have overlapping marginal portions to detachably secure them to the device and to frictionally clamp to the device the ones of said marginally lapped cutting edge members which have underlapping marginal portions, all of said cutting edge members having a cutting edge which is foremost and which projects forwardly beyond the front margin of the earthworking surface.

4,108,251

VEHICLE WITH ADJUSTING DEVICE FOR EARTH-MOVING SHIELD THEREOF

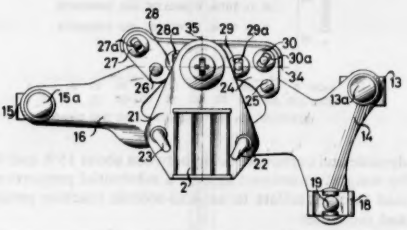
Uwe Rathje, Dortmund-Niederhofen, and Hans Jürgen Schumacher, Dortmund-Asseln, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Continuation of Ser. No. 524,921, Nov. 18, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,692

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1973, 2357495

Int. Cl.[2] E02F 3/76

U.S. Cl. 172—789 **1 Claim**



1. In a vehicle, a frame extending forwardly to the front end of the vehicle and supported on wheels at said front end, an earth-moving shield behind said wheels and a shield carrier supporting said shield, supporting and adjusting means for said shield carrier including a support member fixed relatively to said frame, a pair of arms pivotally connected to opposite sides of said support member and extending laterally outwardly therefrom, a pair of piston-cylinder lifting devices each having one of two telescoping elements pivoted to the outer end of one of said arms, the other telescoping elements of said devices being pivotally connected to opposite ends of said shield carrier, a third sideways adjusting piston-cylinder device having one of its two elements connected to the end of the first of one of said arms spaced below the connection to the one of the two piston-cylinder elements to said arm and the other of its elements extending across to the opposite side of said shield carrier with its end pivotally connected to said carrier at a point offset from the pivoted connection of the piston-cylinder element to the second of said one of said arms on that side, an opening through said support member, a bridge member extending transversely across said support member and pivotally connecting said two arms and having a central opening and at least two laterally spaced openings on each side of said central opening and movable to different positions to register selectively one of its openings with the opening in said support member, so that said openings on each side of the central opening will provide for different positions of said shield, said arms being asymmetrically arranged with the pivot connections of the second of said arms to said support member and said bridge member displaced vertically higher than the corresponding pivot connection of the first of said arms, the openings on opposite sides of the central opening in said bridge member being asymmetrical about a vertical plane through said central opening, with the two openings in the side adjacent the first arm being spaced from the central opening a less distance than the pivot connection of said bridge member to said first arm, and the laterally more outward opening in the bridge member on the side adjacent said second arm being spaced farther from said central opening than the pivot connection of said bridge member to said second arm and above said central opening when the bridge member is in its central position, and a locking bolt mounted on said support member

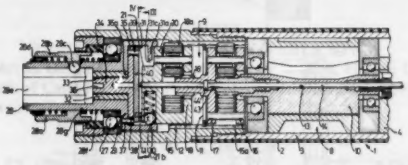
and insertable into said registered openings of said bridge member and said support member to lock said bridge in a fixed position on said support member.

4,108,252

POWER DRIVER FOR THREADED FASTENERS

Reinhold Stroezel, Leinfelden-Oberaichen Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 19, 1975, Ser. No. 550,954
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1974, 2409815
Int. Cl.[2] B25B *21/00*
U.S. Cl. 173—12 **11 Claims**



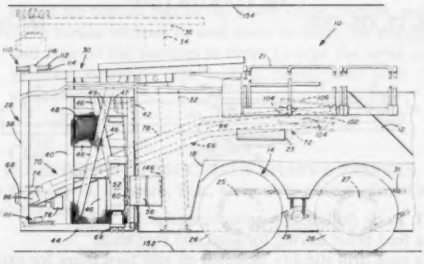
1. A power driver for screws, nuts and analogous fasteners, comprising a housing; a drive motor in said housing; a motor-control switch activatable for turning on said drive motor and deactivatable for shutting off said drive motor; an output shaft connectable with a fastener to be driven and coupled with said drive for rotation by the same; and means for deactivating said motor-control switch when the torque on said shaft exceeds a predetermined selectable level, said deactivating means including a plurality of first surfaces each surrounding the axis of rotation of said shaft and each being spaced from said axis by a distance which changes substantially continuously from a maximum value to a minimum value in circumferential direction of said axis, a plurality of transmitting members mounted for torque-dependent shifting in direction radially of said axis, and substantially radially arranged biasing springs urging said members radially outwardly against respective ones of said first surfaces, adjacent ones of said first surfaces being connected via second surfaces defining substantially discontinuous transitions between the respectively adjacent first surfaces.

4,108,253

ELEVATABLE OPERATOR'S COMPARTMENT HAVING A DRILL STEEL GUIDE FOR A MINE DRILLING MACHINE

Clarence H. Woodford, II, Fairmont, W. Va., assignor to Mining Equipment Division, FMC Corporation, Fairmont, W. Va.

Filed Aug. 26, 1977, Ser. No. 828,154
Int. Cl.[2] E21C *11/02*
U.S. Cl. 173—23 **10 Claims**



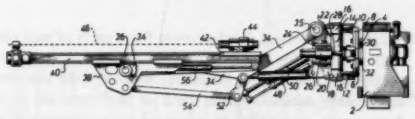
1. A mine drilling machine comprising,
a mobile body,
said mobile body having a front end portion,
a drill boom having a front end portion and a rear end portion,
said drill boom rear end portion being secured to said mobile body to permit upward and downward movement of said drill boom front end portion along a predetermined straight-line path,
a drill pot secured to said drill boom front end portion and adapted to move a drill steel along said predetermined straight-line path,
an operator's compartment mounted for slidable movement upwardly and downwardly relative to said mobile body front end portion,
a drill steel guide secured to said operator's compartment and operable to maintain the drill steel aligned with said predetermined straight-line path, and
said operator's compartment being operable to move said drill steel guide in a plane aligned with said predetermined straight-line path.

4,108,254

DRILLING APPARATUS

Ake Johansson, Skelleftea, Sweden, assignor to Linden-Alimak AB, Skelleftea, Sweden

Continuation of Ser. No. 573,064, Apr. 29, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,469
Claims priority, application Sweden, May 7, 1974, 7406100
Int. Cl.[2] E21B *5/00*
U.S. Cl. 173—43 **9 Claims**



1. Drilling apparatus comprising
a frame,
a drill boom carrying a fluid operated drill means,
a fluid operated positioning mechanism for moving said boom to different positions,
said mechanism being rotatable about a generally horizontally extending axis with respect to said frame,
a cylindrical sleeve member coaxial with said axis forming a rotational shaft for said mechanism in said frame and comprising mounting means for said mechanism,
a stator unit attached to said frame and forming a unitary support bearing coextensive with said sleeve member and engaging both the inside and outside of said sleeve member for support thereof,
a multiple channel conduit means leading through said cylindrical sleeve member from said frame for conducting operating fluids to said mechanism and flushing fluid and operating fluids for said drill means,
motor drive means comprising a rotary gear train coupled for rotating said cylindrical sleeve member,
said cylindrical sleeve member including a toothed gear wheel on the outer periphery thereof forming the output portion of said rotary gear train.

4,108,255

WELL DRILLING APPARATUS

Craig R. Smith, 1317 Center St., Redlands, Calif. 92373

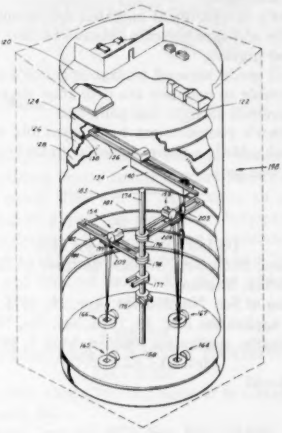
Continuation-in-part of Ser. No. 581,936, May 29, 1975. This application Sep. 1, 1976, Ser. No. 719,573
Int. Cl.[2] E21B *7/12*; E02B *17/02*
U.S. Cl. 175—9 **15 Claims**

1. A well drilling apparatus located within a confining structure having cylindrical annular vertically extending walls rising from a drilling floor and enclosing:
a plurality of rotary drilling tables laterally displaced from each other proximate to said drilling floor and within the

confines of said walls each arranged to accommodate separate drilling assemblies including drilling pipe for drilling separate wells at spatially separated locations at said drilling floor;

an upright support extending upward relative to the drilling floor within said confining structure; and

separate drilling draw work assemblies associated with and



mounted in vertical displacement from each of said rotary drilling tables for manipulating the drilling pipe and other portions of the drilling assembly utilized with the associated rotary table, wherein each of said separate drilling draw work assemblies is mounted on a separate bridge that extends laterally from said upright support and is supported at said vertically extending walls at a distance above the rotary drilling table with which it is associated.

4,108,256

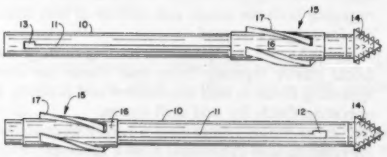
SLIDING STABILIZER ASSEMBLY

Richard G. Moore, III, Enterprise, W. Va., assignor to Continental Oil Company, Ponca City, Okla.

Filed May 12, 1977, Ser. No. 796,093

Int. Cl.[2] E21B *7/04*

U.S. Cl. 175—61 **8 Claims**



1. A method for drilling a generally horizontal borehole through a subterranean coal bed comprising

(a) boring into said coal bed in a generally horizontal direction with a rotatable drill rod having a drill bit at the end thereof, said drill rod also having a longitudinal slot formed therein and having a lateral offset formed in the slot at the end thereof nearest the drill bit, said drill rod further having a stabilizer means mounted thereon for guided movement along said slot, said stabilizer means being maintained in position near the drill bit by the lateral offset during drilling; and

(b) upon desiring to effect a downward dip in the trajectory of said borehole, partially withdrawing said drill rod, reversing the direction of rotation of said drill rod to effect release of said stabilizer from said lateral offset, reinserting said drill rod whereby said stabilizer slides toward the rear of said slot, and resuming drilling.

4,108,257

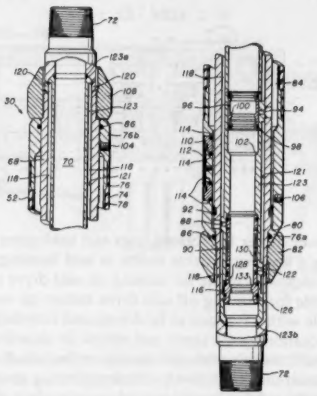
APPARATUS FOR CONTROLLING A WELL DURING DRILLING OPERATIONS

Phillip S. Sizer, Dallas, Tex., assignor to Otis Engineering Corporation, Houston, Tex.

Division of Ser. No. 634,824, Nov. 24, 1978. This application Sep. 14, 1977, Ser. No. 833,012

Int. Cl.[2] E21B *23/04, 33/127, 33/129*

U.S. Cl. 175—230 **26 Claims**



1. A combination for use in a downhole blowout preventer system while drilling a well, the combination comprising:

one structure adapted to be located downhole in a well including:

tubular mandrel means adapted to be located in a well drill string,

packer means carried by said mandrel means, and

communicating means at least in part in a wall of said mandrel means by-passing said packer means and terminating at the exterior wall of said mandrel means; and

a second structure adapted to be pumpable down a drill string to said one structure including:

means for actuating said packer means and rendering said by-passing communicating means operative.

4,108,258

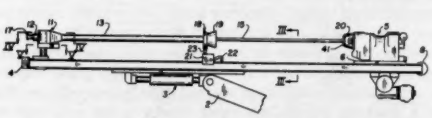
ROCK DRILLING APPARATUS WITH NOISE REDUCING DRILL ROD COVER

Carl G. B. Ekwall, Saltsjobaden, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jul. 21, 1976, Ser. No. 707,349

Int. Cl.[2] E21B *17/00*

U.S. Cl. 175—320 **63 Claims**



1. Rock drilling apparatus comprising:

a feed beam having forward and rear ends;

a rock drill slidably mounted on said feed beam for driving a drill rod in a path parallel to said beam;

elongated strip means coupled between said forward end of the feed beam and said rock drill to form a tubular sound

muffling cover extending around and along said drill rod to muffle the noise of said drill rod;

spool means for selectively rolling said elongated strip means thereon to vary the length of said muffling cover to adapt it to the variable distance between said forward end of the feed beam and said drill; and

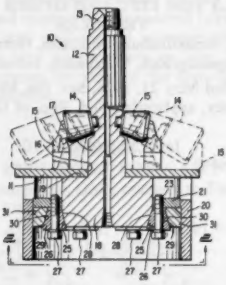
an assembly mounted on the front end of the feed beam forward of the forward end of said elongated strip means, said assembly including a drill rod centralizer and a dust collecting hood having an open front end adapted to contact the working surface of the rock to be drilled and a suction outlet, said muffling cover cooperating with said assembly to completely cover the drill rod from said working face of the rock to said rock drill.

4,108,259

RAISE DRILL WITH REMOVABLE STEM

Robert L. Dixon, Brea, and Malcolm D. Maxsted, Harbor City, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed May 23, 1977, Ser. No. 799,253
Int. Cl.[2] E21B *9/24*
U.S. Cl. 175—344 **7 Claims**



1. A raise drill for enlarging a pilot hole into a larger diameter hole comprising:

a main bit body having a plurality of cutters rotatively mounted thereon for contacting and disintegrating earth formations surrounding the pilot hole, said main bit body further including a central opening;

a drive stem having an upper end adapted to extend into the pilot hole, said drive stem further including a central shank portion extending into the central opening of said main bit body, and a lower shank portion of a larger diameter than said central shank portion, thereby forming an upwardly facing peripheral shoulder therebetween, said shoulder engaging the margin of the central opening of said main body, said drive stem further including a plurality of tapered flat surfaces located about the periphery of the bottom end of the lower shank portion; and

locking means secured to said main bit main body for engaging said tapered flat surfaces in order to urge the drive stem shoulder upwardly into locking engagement with said main bit body.

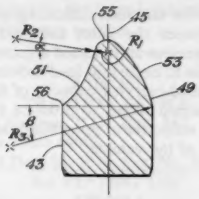
4,108,260

ROCK BIT WITH SPECIALLY SHAPED INSERTS

Rex O. Bozarth, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Apr. 1, 1977, Ser. No. 783,924
Int. Cl.[2] E21B *9/36*
U.S. Cl. 175—374 **7 Claims**

1. In combination with a rolling cutter earth boring drill bit of the insert type, a shaped insert having a base integrally joined to a cutting tip, the cutting tip having a leading flank and a trailing flank converging to an elongated single crest, the



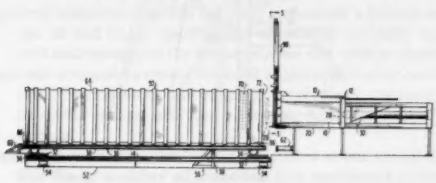
leading flank being concave as seen in a longitudinal section taken normal to the elongated crest.

4,108,261

METHOD FOR LOADING REFUSE INTO CONTAINERS

Harvey W. Liberman; Paul L. Goranson, both of Knoxville; R. Houston Ratledge, Jr., Maryville, and John C. Salyers, Oak Ridge, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 641,375, Dec. 17, 1975. This application May 19, 1977, Ser. No. 798,713
Int. Cl.[2] G01G *13/02, 5/04;* B30B *15/00*
U.S. Cl. 177—120 **5 Claims**



1. A method of loading a container with refuse comprising the steps of:

inserting refuse into said container;

weighing said container as loading progresses;

sensing pressure of refuse in said container as loading progresses; and

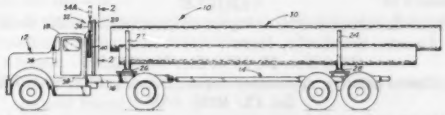
discontinuing said inserting step when said container has reached either a predetermined weight or a predetermined pressure.

4,108,262

VEHICLE LOAD COUNT-DOWN SYSTEM

Joe H. Anderson, Rte. 1, Box 78, Dexter, Oreg. 97401

Filed Feb. 16, 1977, Ser. No. 769,026
Int. Cl.[2] G01D *19/08*
U.S. Cl. 177—136 **10 Claims**



1. A count-down load-monitoring system for a load-carrying vehicle of the type including on-board load-monitoring apparatus, which vehicle is required to carry no more than a certain maximum load, said system in operative condition in a vehicle comprising

count-down load-indicating means mounted on the vehicle for viewing from a distance away from the vehicle, opera-

ble to indicate a decreasing, additional load-carrying capacity for the vehicle within a selected range extending below said certain maximum load as load is added to the vehicle, and

informing means for said load-indicating means operatively interposed between the latter and said on-board load-monitoring apparatus and located adjacent the operator's station, operable to cause said load-indicating means, with the additional load-carrying capacity of the vehicle falling within said selected range, to produce a remotely viewable indication reflective of remaining additional load-carrying capacity of the vehicle.

4,108,263

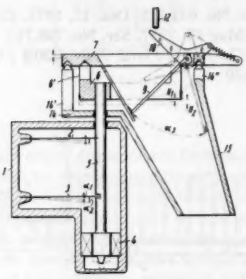
METHOD AND APPARATUS HAVING A VIBRATION-FREE MEASURING PHASE FOR AUTOMATICALLY WEIGHING BULK MATERIAL, MORE PARTICULARLY TOBACCO

Heinz Focke, and Oskar Balmer, both of Verden, Aller, Germany, assignors to Focke & Pfuhl, Verden, Germany

Filed Jun. 14, 1976, Ser. No. 695,693

Int. Cl.[2] G01G *19/00, 23/02*

U.S. Cl. 177—145 **8 Claims**



1. In an apparatus for automatically weighing and separating specific individual quantities of a bulk material such as tobacco, said apparatus having a weighing container and a measuring system having a carrier, the improvement comprising: means for separating the weighing container from the carrier during a phase in operation of said apparatus when no measurement takes place, said means including a load frame coupled to said weighing container, a weighing arm coupled to said carrier, a measuring coil attached to said weighing arm and a fixed supporting frame, whereby when the force field of said measuring coil is inoperative, said arm and carrier are lowered thereby effecting a load change between the carrier and said fixed supporting frame to set the load frame upon the fixed supporting frame temporarily separating said weighing container from the carrier.

4,108,264

CABLE TAKE-UP DEVICE FOR ELECTRIC DRIVE VEHICLE

Yujiro Tanaka, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Japan

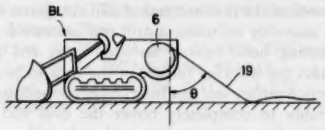
Filed Dec. 20, 1976, Ser. No. 752,595

Claims priority, application Japan, Dec. 29, 1975, 50-157702

Int. Cl.[2] B60L *9/04*

U.S. Cl. 180—2 R **7 Claims**

1. A cable take-up device for an electric drive vehicle supplied with electric power through a cable, said device comprising a cable drum rotatable in opposite directions for taking up and unwinding the cable; a reversible DC motor for driving the drum in its cable taking up and unwinding directions; detecting means for electrically detecting slackening, i.e. a slack angle, of said cable, said detecting means including a movable bar arranged to contact said cable and follow the slackening thereof and a transducer actuated by said movable bar to produce a slack angle signal representing the instantaneous magnitude of said slack angle; a slack angle setting device for producing a reference signal representing a preset magnitude of said slack angle; deviation signal generating means responsive to the signals produced by said transducer



and slack angle setting device for generating a deviation signal representing the magnitude and sense of any deviation in magnitude of the instantaneous slack angle from the preset slack angle; and control means for controlling said DC motor in response to said deviation signal so as to minimize said deviation signal and thereby maintain the slack angle of the cable substantially constant at said preset magnitude thereof.

4,108,265

HYDROSTATIC-TRANSMISSION CONTROL SYSTEM, ESPECIALLY FOR LIFT AND OTHER INDUSTRIAL VEHICLES

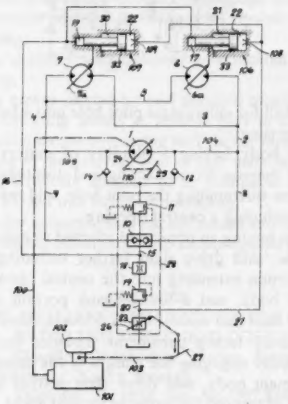
Theodor Abels, Aschaffenburg-Nilkheim, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed May 21, 1976, Ser. No. 688,774

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522719

Int. Cl.[2] B60K *17/10*

U.S. Cl. 180—66 R **2 Claims**



1. A vehicle-drive system comprising:

a prime mover;

a pair of driven wheels for propelling said vehicle;

a hydrostatic transmission having variable-displacement pump means formed with an input shaft connected to said prime mover, motor means hydraulically connected to said pump means and formed with at least one output shaft connected to said wheels, and a motor-displacement control element, said transmission having a variable speed ratio between said input shaft and said output shaft depending at least in part upon the position of a pump-displacement control element for regulating the displacement per revolution of said pump means;

at least one operator-controlled actuating member; and

control means operatively connecting said member with said

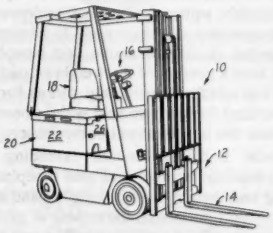
pump-displacement control element, operatively connected to said motor-displacement control element, and effective at low to average speeds of said motor means and said output shaft for establishing said ratio solely as a function of said member and at higher speeds of said motor means and said output shaft controlling said ratio as a function of the motor-displacement element as another operating parameter of the drive system, said motor means comprising a pair of motors having a variable fluid displacement per revolution and respective control elements for establishing the fluid displacement per revolution of said motors, each of said motors being formed with a hydraulic servomotor operatively connected to the respective control element of the motor, said pump means including a reversible hydrostatic pump having a pair of ports, each of said motors having a pair of ports connected to the pair of ports of said pump, said control means comprising a changeover valve having inlet ports respectively connected to the ports of said pump and at least one output port, a first pressure-relief valve connected between said output port and the ports of said pump by respective check valves, a first control line connected with the output port of said changeover valve and one side of each servomotor, a fixed-cross-section throttle connected with said first line, a second pressure-relief valve downstream of said fixed-cross-section throttle, a variable-cross-section throttle downstream of said second pressure-relief valve, a second control line connected between said variable throttle and said second pressure-relief valve and opening into said servomotors on the opposite sides thereof, and means for varying the flow-cross-section of the variable throttle.

4,108,266

BATTERY ENCLOSURE FOR A LIFT TRUCK

Elias Wojtyna, Strongsville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Apr. 28, 1977, Ser. No. 791,092
Int. Cl.[2] B62D *25/00*
U.S. Cl. 180—68.5 **8 Claims**



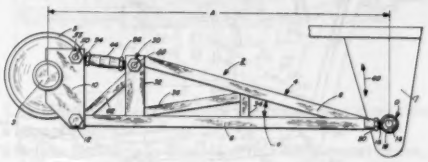
1. A battery enclosure apparatus comprising:
wall means;
a top comprising first and second top portions positionable on the wall means to form a battery enclosure;
a plurality of tabs extending from each top portion;
means defining a plurality of recesses associated with the wall means, each tab being positionable in a recess with the top portions positioned on the wall means to form a battery enclosure, to prevent lifting of the top portions from the wall means;
each top portion being movable laterally of the wall means to move the tabs thereof to positions relative to the wall means wherein each top portion may be lifted from the wall means;
means for selectively securing the first top portion together with the second top portion in position on the wall means to form a battery enclosure; and
first additional tab means secured relative to the wall means and extending toward the top, and second additional tab means secured to at least one of the first and second top portions and positioned relative to the first additional tab means, with the top portion in position on the wall means, to limit movement of the one top portion in a sideward direction relative to the lateral movement thereof allowing lifting of that top portion.

4,108,267

TRACTION DEVICE

Robert Michael Valerio, P.O. Box 153, 5214 Chapel Rd., North Madison, Ohio 44057

Filed Dec. 20, 1976, Ser. No. 752,310
Int. Cl.[2] B60G *1/00*
U.S. Cl. 180—71 **4 Claims**



1. A traction device for selectively stabilizing the load and torque characteristics for use in the rear suspension system of a vehicle comprising,
a frame,
said frame including a first frame member,
pivotal connection means operably connected adjacent one end of said frame member and adapted to pivotally connect said one end of the frame member to a vehicle chassis,
pivotal connection means disposed adjacent the other end of said frame member and adapted for pivotally connecting the other end of said frame member to a rear axle of a vehicle,
a second frame member fixedly connected at one end to the first frame member adjacent the first mentioned pivotal connection means,
pivotal connection means disposed adjacent the other end of the second frame member and spaced from said first frame member, and
lengthwise adjustable link means pivotally connected at one end to said third mentioned pivotal connection means and adapted for pivotal connection at the other end to said rear vehicle axle whereby selective adjustment of said link means pivots said first frame member about the second mentioned pivot means so as to raise and lower the end of the first frame member adjacent the first mentioned pivot means.

4,108,268

ACTUATOR FOR SELF-PROPELLED SWEEPER

Thomas S. Block, Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.

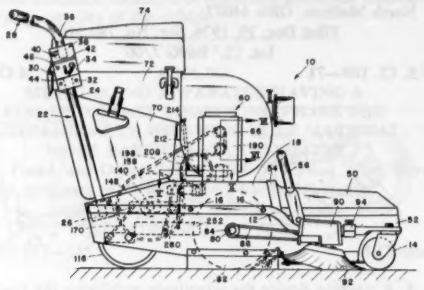
Filed Mar. 2, 1977, Ser. No. 773,701
Int. Cl.[2] B60K *23/00*
U.S. Cl. 180—74 **18 Claims**

1. A drive actuator for a self-propelled device of the type including a power unit comprising:
a frame;
a wheel shaft supported at its ends for rotational movement on said frame;
a ground engaging wheel rotatably mounted on said wheel shaft;
a jackshaft rotatably mounted and supported at both ends on said frame in spaced relationship with said ground engaging wheel and for limited movement about one end thereof towards and away from said ground engaging wheel, said jackshaft being rotated by said power unit;
linkage means interconnecting said wheel shaft and said jackshaft for moving said jackshaft towards and away

from said ground engaging wheel upon rotation of said wheel shaft;

drive means on said jackshaft for rotating said ground engaging wheel upon rotation of said wheel shaft and movement of said jackshaft;

a handle supported by said frame and including a pivotally mounted portion movable between a first and second position; and



actuator means at least partially enclosed within said handle and shifted by said pivotally mounted portion of said handle for rotating said wheel shaft when said handle portion is moved between said first and said second positions whereby said drive means rotates said ground engaging wheel.

4,108,269

NO-MAN CONTROL SYSTEM FOR WORKING VEHICLES

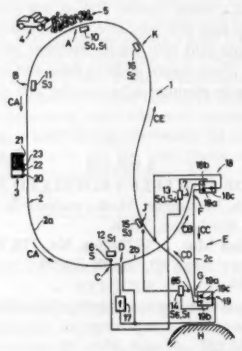
Kiyoharu Nakao, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed May 12, 1977, Ser. No. 796,500

Claims priority, application Japan, Aug. 31, 1976, 51-104543; Oct. 18, 1976, 51-124531; Feb. 15, 1977, 52-15423

Int. Cl.² B62D *1/28*

U.S. Cl. 180—98 **9 Claims**



1. A no-man control system for a working vehicle comprising an induction cable installed along a predetermined running course between a loading station and an unloading station, a detection coil mounted on said working vehicle to detect current flowing through said induction cable, a steering control device responsive to the signal detected by said detection coil for steering said working vehicle to run along said cable, vehicle position detection means for detecting the position of said vehicle when it reaches a predetermined position, a vehicle speed commanding device responsive to the output of said vehicle position detection means for accelerating and decelerating the vehicle, a vehicle speed control device for controlling the vehicle speed in accordance with the difference between a speed commanded by said vehicle speed commanding device and an actual vehicle speed thereby controlling said vehicle to run along said predetermined running course between said loading and unloading stations, and a switch back station near said unloading station, a substantially triangular running course being formed in said switch back station and having apices at an entrance and exit position, a reverse position and an unloading position, respectively.

4,108,270

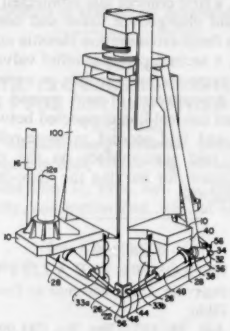
HYDRAULIC STABILIZATION SYSTEM TO POSITION AND ISOLATE A SEISMIC VIBRATOR

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Feb. 9, 1977, Ser. No. 767,181

Int. Cl.² G01V *1/14*

U.S. Cl. 181—114 **15 Claims**



1. In a vibratory seismic energy source adapted to be transported on a vehicle, including a vertically disposed piston and cylinder assembly, a piston rod extending downward from said piston and connected at its lower end to a baseplate, a weight-bearing member positioned above said baseplate, means for applying at least a portion of the weight of said vehicle to said weightbearing member and elastic means for coupling substantially vertical forces from said weight-bearing member to said baseplate, the improvement comprising:

a hydraulic stabilizing means extending between said weight-bearing member and said baseplate for interconnecting said weight-bearing member and said baseplate in order to limit horizontal movement of said baseplate relative to said weight-bearing member and to isolate vibratory motions of said baseplate from said weight-bearing member, said stabilizing means being hydraulically interconnected to permit vertical motion of said baseplate relative to said weight-bearing member.

4,108,271

SEISMIC LAND SOURCE

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

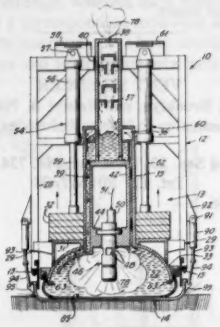
Filed Jun. 10, 1977, Ser. No. 805,522

Int. Cl.² G01V *1/04*

U.S. Cl. 181—119 **20 Claims**

18. In a seismic energy land source for surveying on the earth by transmitting seismic energy impulses into the earth and being of the type having a rigid dome-shaped bell for containing a substantially incompressible liquid such as water with at least one airgun for abruptly releasing high pressure pressurized gas into the liquid in the dome-shaped bell for generating said seismic impulses, said dome-shaped bell being movably mounted in an upright mounting frame for upward

and downward movement of the bell relative to said mounting frame, said bell having a lower rim with a metal pan positioned below said lower rim for engaging the surface of the earth below said bell, said pan being movably mounted in said mounting frame for upward and downward movement relative to said bell and mounting frame, said pan having a rounded shoulder portion with a peripheral wall extending upwardly



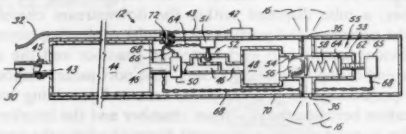
from said rounded shoulder portion around said bell, and an elastomeric diaphragm extending across the bottom of said bell above said pan for retaining the liquid in said bell, the improved apparatus for transmitting powerful seismic impulses into the earth comprising: said metal pan having a tapered bottom wall decreasing in wall thickness from said rounded shoulder portion toward the center of said bottom wall.

4,108,272

RAPID FIRE AIR GUN

John Lloyd Paitson, Galveston, and Robert N. Hendley, Houston, both of Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

Filed May 12, 1977, Ser. No. 796,494
Int. Cl.[2] G01V *1/38*
U.S. Cl. 181—120 **4 Claims**



4. A rapid fire air gun for generating an acoustic chirp signal in a body of water during a recording cycle, for use in seismic exploration, said gun including a firing chamber for containing a volume of compressed air, said firing chamber being interconnected with a compressed air source and having an outlet for periodically discharging air jets, comprising:

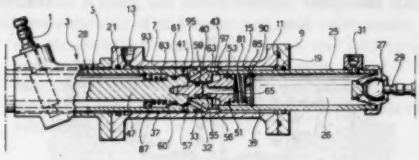
a self-excitable valve assembly mounted adjacent said outlet for repeatedly opening and closing said outlet so that jets of compressed air are expelled from said firing chamber each time said valve assembly opens, at the excitation frequency of the valve assembly, said valve assembly including a valve seat, a compliantly-loaded, differential-area valve element for releasably engaging said valve seat, and means for continuously varying the compliant loading of said valve element during said recording cycle to vary the self-excitation frequency of said valve assembly.

4,108,273

POWER ASSISTED STEERING

Vincenzo Sarti, Turin; Antonino Bertone, Sant'Antonino (Vercelli), and Enrico Rivetti, Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed May 11, 1977, Ser. No. 795,849
Claims priority, application Italy, Nov. 25, 1976, 69812 A/76
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—148 **6 Claims**



1. A hydraulic power assisted steering device comprising:

a support sleeve,

a hollow shaft axially slidable within said support sleeve, the two ends of said hollow shaft projecting from the support sleeve and carrying means for connection to the steerable wheels of the vehicle,

an intermediate section of said hollow shaft, said intermediate section having a radially inwardly directed projecting part, and a radially outwardly directed projecting part having two opposed radial faces,

a control rod axially slidable within said hollow shaft on one side of said intermediate section,

a valve head carried on said control rod and located on the opposite side of said intermediate section,

a portion of said valve head being slidably disposed within said radially inwardly directed projecting part of said intermediate section of said hollow shaft in sealed relation thereto, said two opposed radial faces of said radially outwardly projecting part forming end walls of first and second chambers defined between said hollow shaft and said support sleeve, the face of said intermediate section of said hollow shaft exposed in said first of said two chambers being smaller than the radial face of said intermediate section of said hollow shaft exposed in said second of said two chambers,

means defining a plurality of passages in the walls of said hollow shaft, in said intermediate portion thereof, in said valve head, between said intermediate portion of said hollow shaft and said valve head and between said intermediate portion of said hollow shaft and said control rod,

means for connecting said device into a hydraulic circuit comprising inlet means in communication with the first of said two chambers and outlet means in communication with the portion of said hollow shaft on said opposite side of said intermediate section; said plurality of passages interconnecting said inlet and outlet means in series so that upon displacement of said control rod axially in one direction toward said intermediate section of said hollow shaft the passage therebetween will be restricted to create an increase in pressure in said first of said two chambers resulting in displacement of said hollow shaft in a first direction and upon axially displacement of said control rod in the other direction with respect to said intermediate portion of said hollow shaft the passage between said intermediate section of said hollow shaft and said valve head will be restricted such as to create an increase in pressure in both of said two chambers resulting in displacement of said hollow shaft in the opposite direction due to the difference in areas of said radially faces of said intermediate section of said hollow shaft exposed in said first and second chambers.

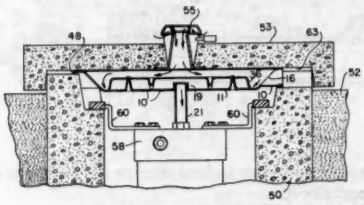
4. A hydraulic power assisted steering device as in claim **1**, wherein said control rod is formed with a rack for forming part

of a rack and pinion coupling with a cooperating pinion on the steering column of a vehicle to which the device is fitted.

4,108,274
ACOUSTICAL APPARATUS

John R. Snyder, Fort Wayne, Ind., assignor to Jet Aeration Company, Cleveland, Ohio

Filed Jul. 6, 1976, Ser. No. 702,581
Int. Cl.[2] F01N *1/00*
U.S. Cl. 181—229 **12 Claims**

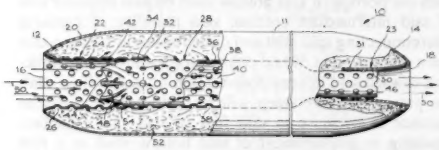


1. An apparatus for reducing acoustical pressure at a tubing, comprising in combination: a first member having first support means with an orifice extending therethrough and first side means; a plurality of first wall means extending from said first support means and extending annularly about said orifice and interposed between said orifice and said first side means of said first member; a second member having second support means and second side means; one of said first and second members being smaller than the other of said first and second members; a plurality of second wall means extending from said second support means and extending annularly about the center of said second support means and interposed between the center of said second support means and said second side means; means mounting said first member to said second member with said first and second wall means forming a passage between said orifice and an opening formed between said first and second side means of said first and second members; and means for connecting one of said first and second members to the tubing with one of said orifice and said opening formed between said first and second side means being in communication with the tubing when connected.

4,108,275
MUFFLER

William M. Black, 251 Longley Way, and R. Bruce McCallum, 1730 Alta Oaks Dr., both of Arcadia, Calif. 91006

Filed May 31, 1977, Ser. No. 801,905
Int. Cl.[2] F01N *1/04*
U.S. Cl. 181—252 **12 Claims**



1. An improved engine exhaust gas muffler, said muffler comprising, in combination:

a. an outer hollow tubular elongated shell having a gas inlet and a gas outlet;

b. a hollow perforated tubular extension secured and open to the inlet end of said shell and extending within said shell along only a portion of the length thereof substantially coaxially with said shell;

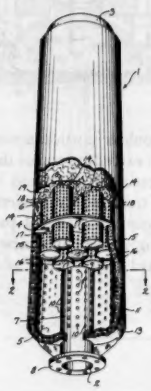
c. a hollow perforated tubular insert having an open upstream free end slideably disposed within the downstream end of said extension and having a downstream end terminating adjacent to the gas outlet end of said shell, said insert being substantially coaxial with said shell, said upstream end of said insert having a terminal portion of smaller diameter than the main body of said insert so as to form with said extension downstream end means for diverting gases, when passing through said shell into a plurality of elongated paths; and,

d. sound deadening means within said shell outside of said extension and insert.

4,108,276
VENT SILENCER

Leonard F. Hall, Brooklyn, and Robert A. Noreen, Stoughton, both of Wis., assignors to Nelson Industries, Inc., Stoughton, Wis.

Filed Sep. 20, 1976, Ser. No. 724,545
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—256 **6 Claims**



1. An acoustical silencer, comprising a housing having an inlet to be connected to a device emitting sound energy and having an outlet, divider means dividing said housing into an upstream chamber communicating with said inlet and a downstream chamber communicating with said outlet, a diffuser disposed within the upstream chamber and connected to said inlet and having at least one aperture therein providing communication between the interior of the diffuser and the inlet chamber, a tube disposed within the downstream chamber with the upstream end portion of the tube projecting beyond said divider means into said upstream chamber and the upstream end of the tube being closed, first port means disposed in the projecting end portion of the tube and providing communication between the upstream chamber and the interior of the tube, a sound absorbing material disposed within the downstream chamber in the space surrounding said tube, and second port means disposed in the portion of the tube located within said downstream chamber and providing communication between the interior of the tube and said space.

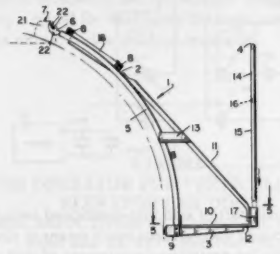
4,108,277
WORK PLATFORM

Leonard Goldstein, and Michael Yashin, both of 660-668 Berriman St., Brooklyn, N.Y. 11208

Filed Apr. 14, 1977, Ser. No. 787,650
Int. Cl.[2] E04G *3/14, 1/16*
U.S. Cl. 182—82 **6 Claims**

1. A work platform for attachment to a jet engine having a plurality of mountings located on the upper portion of the engine, each comprising upper and lower spaced apart horizontal support pins rigidly located with respect to the engine; the work platform comprising a frame curved to generally

conform with the exterior of a said engine, latch members rigidly attached to and extending from said frame and adapted to attach the frame to said mountings, a platform attached to the frame remove from the latch members and extending horizontally from the frame when the latch members are attached to the mountings, and stop means located adjacent the platform to rest against the engine when said latch members are attached to the mountings, wherein each latch member is positioned to engage a corresponding mounting and has a tapered tongue to facilitate insertion of the latch member into the space between the upper and lower horizontal pins of an associated



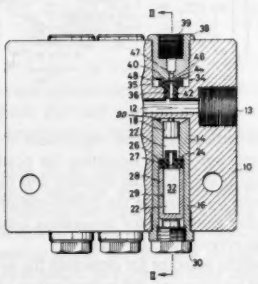
mounting and a recess adjacent the base of the tongue to engage the lower of the horizontal pins when the latch member is inserted into the space, the tongue having a surface to engage the upper of the horizontal pins upon pivotal motion of the platform into an operational position in which said stops are resting against the engine when the lower horizontal pin is engaged with the recess, the recess being oriented to prevent removal of the latch member from the mounting, by virtue of the cooperation of the latch member with the upper and lower horizontal pins, when the platform is in said operational position.

4,108,278

CONSTANT-QUANTITY OIL DISTRIBUTING VALVE FOR USE IN CENTRAL LUBRICATION SYSTEM

Yoshio Imada, c/o Kabushiki Kaisha Japan Herg, No. 203, Rose-Plaza Kagetsuan, No. 4 20 Namamugi 5-chome, Tsurumi-ku, Yokohama, Japan

Filed Nov. 15, 1976, Ser. No. 741,865
Int. Cl.[2] F16N *25/00*
U.S. Cl. 184—7 D **1 Claim**



1. A constant-quantity oil distributing valve for use in a central lubrication system, comprising from one side to the other:

an outlet portion provided in an end plug having a build-up portion on the inner end surface thereof, said build-up portion including a passage leading to said outlet port;

valve means including a resilient valve body and a valve seat, said resilient valve body being disposed between said build-up portion and said valve seat, and said valve means further including a passage therein;

an inlet passage communicated with said passage in said valve means;

an oil accumulating chamber which may be communicated with said inlet passage or said port, depending on the elastically deformed positions of said resilient valve body;

a piston facing said oil accumulating means; and

a pressure accumulating chamber, in which a compressible material is filled, and which contains said piston therein;

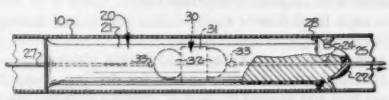
whereby the axes of said outlet port, said valve means, said oil accumulating means, said piston and said pressure accumulating chamber being in alignment on a line with each other, with the axis of said inlet passage being directed at a right angle to said axes or a common axis of the other components.

4,108,279

DISPENSER AND METHOD FOR APPLYING LUBRICANT OR OTHER MATERIAL TO THE INTERIOR OF A CONDUIT

William B. Marcell, Fort Myers Beach, Fla., assignor to Thomas Industries of Tennessee, Inc., Matthews, N.C.

Filed Oct. 20, 1976, Ser. No. 734,234
Int. Cl.[2] F16N *9/00*
U.S. Cl. 184—15 R **4 Claims**

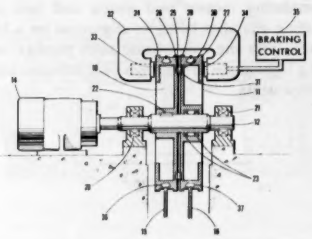


2. A dispensing device adapted for passage through a conduit while applying a coating material along the interior surface of the conduit, said device comprising an elongate tubular body of external dimensions adapted to pass through the conduit, said tubular body having a hollow interior portion adapted for containing a supply of the coating material therein and having a plurality of openings at circumferentially spaced locations adjacent the leading end thereof communicating with the hollow interior portion of the body and through which the coating material may be dispensed, said elongate tubular body being of an external dimension smaller than the diameter of the conduit and including fin means adjacent the trailing end thereof and extending radially outwardly for engaging the interior surface of the conduit to spread the coating material along the interior surface of the conduit as the dispensing device travels therethrough, said tubular body also including an additional fin means adjacent the leading end thereof and rearwardly of said openings, the respective fin means serving to insure a uniform application of coating material along the entire interior surface of the conduit, an elongate connector having a portion thereof extending axially into the hollow interior portion of said elongate body from one end thereof and being longitudinally movable relative to said body, means provided on a portion of said connector located outside of said body to permit securing the connector to a pulling implement to facilitate pulling the dispensing device through the conduit, and piston means carried by said connector interiorly of the hollow body, and piston means being movable relative to said body in response to said body encountering frictional resistance to passage through the conduit to thereby force coating material from the hollow interior portion of the body as the dispensing device is pulled through the conduit.

4,108,280
PLURAL ROPE FRICTION HOIST WITH BRAKING APPARATUS

Peter DeH. Eastcott, and Peter T. Truman, both of Peterborough, Canada, assignors to Canadian General Electric Company, Ltd., Toronto, Canada

Filed Dec. 27, 1976, Ser. No. 754,188
Claims priority, application Canada, Feb. 13, 1976, 245657
Int. Cl.[2] B66B *11/08*
U.S. Cl. 187—20 **3 Claims**



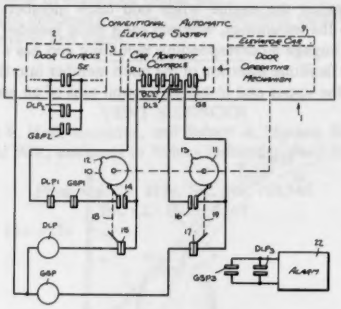
1. A friction hoist comprising:
(a) at least two friction wheels each having a rim portion on a side thereof facing an adjacent wheel and an outwardly directed rim face on the side not facing an adjacent wheel;
(b) means including a common fixed shaft for supporting the friction wheels coaxially with one another and adjacent one another for rotation independently of one another, said friction wheels being arranged for limited axial movement with respect to one another;
(c) a rope looped over each friction wheel and having frictional engagement therewith;
(d) conveyance means suspended by the ropes;
(e) first and second motor means for driving, respectively, said first and second friction wheels for rotating the wheel to raise and lower the conveyance means;
(f) first braking material between said facing rim portions to provide braking with respect to relative movement between adjacent wheels when they are urged together;
(g) braking means having a second braking material for braking engagement with said outwardly directed rim faces; and,
(h) braking control means for actuating said braking means to cause movement of said second braking material into and out of braking engagement with said outwardly directed rim faces, movement of said second braking material into braking engagement with said outwardly directed rim faces applying a braking force to the friction wheels they engage and urging said friction wheels together for engagement with said first braking material.

4,108,281
ELEVATOR DOOR TAMPERING PROTECTION SYSTEM

Walter G. Glaser, Montvale, N.J., assignor to G.A.L. Manufacturing Corporation, Bronx, N.Y.

Filed May 5, 1977, Ser. No. 794,019
Int. Cl.[2] B66B *13/22*
U.S. Cl. 187—29 R **9 Claims**

1. In an automatic elevator system having an elevator car with a car door, means mounting said car in a hoistway extending between a plurality of floors in a building, a floor door at each of said floors for providing access to said car, control means including hoisting apparatus for moving said car from one of said floors to another and stopping said car at a floor, door operating means for automatically opening and closing at least said car door when the car is at a floor and switch means operable in accordance with the positions of said car door and each said floor door for controlling said control means and permitting said control means to move said car from said floor to another when said car door and each said floor door is closed, the combination therewith of further switch means operable in accordance with the position of at least one of said car door and said floor door and normally operable prior to the

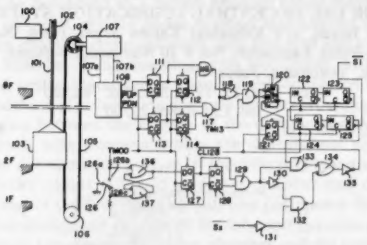


operation of at least part of said first-mentioned switch means, and means connecting said further switch means in circuit with said control means for preventing movement of said car when said part of said first-mentioned switch means is operated prior to operation of said further switch means.

4,108,282
POSITION-INDICATING SIGNAL EQUIPMENT FOR ELEVATOR

Tsuyoshi Satoh, and Kenzo Tachino, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1976, Ser. No. 721,754
Claims priority, application Japan, Sep. 17, 1975, 50-112464
Int. Cl.[2] B66B *3/02*
U.S. Cl. 187—29 R **5 Claims**



1. A position-indicating signal equipment for an elevator cage is an elevator system for detecting the position by generating pulses depending upon the distance and direction of the elevator cage and by counting the pulses comprising:
a position-pulse generator for generating pulses depending upon the movement of the cage;
a present position detector for detecting the present position of the cage by counting the output pulses of the position-pulse generator;
a floor position read only memory which memorizes floor position signals as data signals of a binary number calculated by providing a binary number for each floor as each address and calculating the absolute distance from the reference position to the floor to the number of output pulses of the position pulse generator;
a plurality of floor position registers for storing the floor position signals;

a plurality of floor indicators for outputing the floor numbers;

a time dividing selector which time-division selects the output of the floor indictors as the addresses of the floor position read only memory and sequentially allots the output of the floor position read only memory to the floor position registers;

a selector indicator for selecting the outputs of the floor number indicators; and

an arithmetic unit for comparing the output of the present position detectors and the output of the floor position registers to generate an output of the result of operation to the floor indicators and the selector indicator;

whereby a signal for indicating the cage position is obtained as the output of the selector indicator.

4,108,283

MASTER OPERATOR FOR VERTICALLY MOVING ELEVATOR CAR DOORS

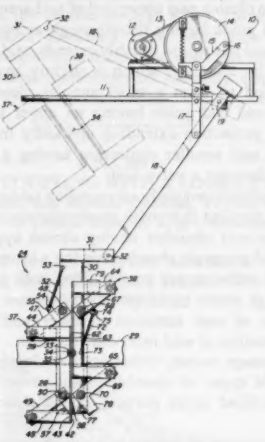
Karl Mangel, 850 N. Dewitt Pl., Chicago, Ill. 60611

Filed Jan. 21, 1977, Ser. No. 761,545

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.[2] B66B *13/12*

U.S. Cl. 187—52 LC **10 Claims**



10. In an elevator system including an elevator car having a vertically movable gate and a plurality of vertically movable landing doors respectively located at a plurality of landings, comprising

a driving clutch means rotatably mounted to said gate and having clutch surfaces movable between retracted declutching positions and extended clutching positions,

a plurality of driven clutch members respectively mounted to said landing doors for selected engagement by said driven clutch means to open the door disposed opposite said elevator car when said gate is opened,

each of said driven clutch members comprising

a base member rotatably mounted to the respective landing door, and

a plurality of rollers rotatably mounted to said base member on opposite sides of the axis of rotation of said base member,

the axes of rotation of said rollers being parallel to the axis of rotation of said base member.

4,108,284

RAILWAY BRAKE ASSEMBLIES INCLUDING KNOCK-BACK COMPENSATING MEANS

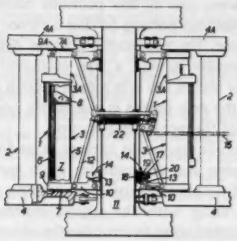
Anthony William Harrison, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Jun. 8, 1976, Ser. No. 693,798

Claims priority, application United Kingdom, Jun. 9, 1975, 24696/75

Int. Cl.[2] B61H *13/20*

U.S. Cl. 188—59 **14 Claims**



1. A brake assembly for a wheel and axle set of a railway vehicle, comprising two rotors having opposed braking surfaces, two braking shoe means, one only associated with each rotor, and a single brake-applying means actuating both braking shoe means, wherein each braking shoe means comprises a friction member engageable with its associated braking surface, a support carrying said friction member and being movable to a datum position under the action of a return force provided by a brake return spring means, a fixed structure, a pivoted link connecting said support to said fixed structure to permit movement of said support towards and away from its associated braking surface in response to operation of said brake-applying means to engage and disengage said friction member with said surface, and resilient means separate from said brake return spring means which biases said pivoted link to a datum position in which said support is held in its said datum position, said resilient means being yieldable when said return force exceeds a predetermined amount to permit movement of said support beyond its datum position in a direction opposite to its brake applying direction and operative to return said support member towards the datum position when the return force is reduced below said predetermined amount, whereby wear of said friction members is equalized.

4,108,285

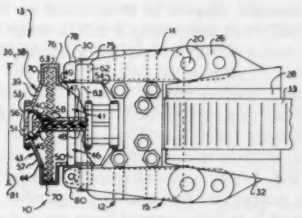
CALIPER BRAKE ACTUATING CYLINDER

Jacob Kobelt, 6110 Oak St., Vancouver, B.C., Canada (V6M 2W2)

Filed Mar. 21, 1977, Ser. No. 779,914

Int. Cl.[2] F16D *55/26*

U.S. Cl. 188—72.6 **10 Claims**



1. A caliper brake actuator for use in a caliper brake assembly, the brake assembly having: a frame, a pair of arm means

hinged to the frame and having inner ends carrying opposed brake shoes and outer ends adapted to cooperate with the actuator; the actuator having an actuator body, a diaphragm and a piston member, the diaphragm and piston member cooperating with the actuator body to permit the piston member to reciprocate within the body to permit the piston member to reciprocate within the body in response to fluid pressure applied to the diaphragm, the brake actuator being further characterized by:

(a) the actuator body having a first cylinder having inner and outer portions, one of the portions having an adjacent hollow projecting portion having a closed outer end with an outer face, the projecting portion defining in part a clearance recess having a size sufficient to accept the outer end of one of the arm means therein so that an outer portion of the arm means is essentially coplanar with the outer face of the projecting portion,

(b) at least two compression springs extending between the piston member and the cylinder, each spring having one end located within the projecting portion and an opposite end cooperating with the piston member, the springs being positioned so as to straddle the clearance recess and to move the piston member when fluid pressure is reduced.

4,108,286

BRAKE DISC FOR AN AXLE OF A RAILWAY VEHICLE

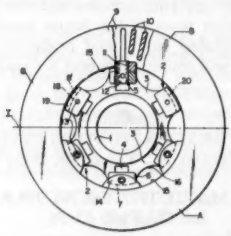
Gregory G. Gagarin, Chevy Chase, Md., assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed May 9, 1977, Ser. No. 795,130

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2644223

Int. Cl.[2] F16D *65/12*

U.S. Cl. 188—218 XL **5 Claims**



1. A brake disc adapted to be mounted on the axle of a railway vehicle and comprising a hub, a brake disc annular element mounted radially on said hub, a plurality of circumferentially spaced cam portions on one of said hub and annular element and extending radially toward the other, the outer surfaces of said cam portions defining a cylinder, a plurality of circumferentially spaced extensions on the other of said hub and annular element and extending radially toward said cam portions and having circumferentially extending grooves thereon to receive said cam portions, a plurality of clamping sleeves seated in radially opposed bores om said cam portions and radial extensions, the other of said hub and annular element having radial recesses therein between said clamping sleeves shaped to accommodate said cam portions on an axial direction such that the annular element is assembled axially over the hub.

4,108,287

DOUBLE-CYLINDER BUFFER

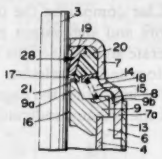
Tetuo Kato, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed Apr. 5, 1977, Ser. No. 784,776

Claims priority, application Japan, Apr. 10, 1976, 51-40614

Int. Cl.[2] F16F *9/32*

U.S. Cl. 188—315 **4 Claims**



1. A double-cylinder buffer comprising:

an actuation cylinder having a closed lower end and an upper end, said actuation cylinder being filled with oil;

a piston rod extending into said actuation cylinder through said upper end thereof;

a piston secured to the lower end of said piston rod, said piston slidably contacting the inner wall surface of said actuation cylinder, said piston dividing the interior of said actuation cylinder into upper and lower oil chambers, said piston having a damping force producing mechanism;

a rod guide closing said upper end of said actuation cylinder, said rod guide having therethrough an opening through which said piston rod slidably extends, said opening being formed by a surface which is slightly spaced from said piston rod to form a small annular clearance therebetween, said rod guide having an upper surface and an annular projection extending upwardly from said upper surface, said annular projection having a radially outer surface forming a valve seat;

an outer cylinder coaxially surrounding said actuation cylinder and forming therewith an annular reservoir chamber, said reservoir chamber having closed upper and lower ends, said reservoir chamber having a lower portion filled with oil and an upper portion filled with gas;

first passage means communicating between said lower oil chamber of said actuation cylinder and said oil-filled lower portion of said reservoir chamber;

second passage means, including said clearance, extending from said upper oil chamber of said actuation cylinder to said gas-filled upper portion of said reservoir chamber; and

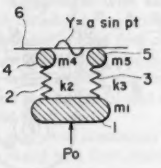
means, positioned in said second passage means, for causing all oil passing through said clearance from said upper oil chamber to pass into said reservoir chamber, and for preventing gas in said reservoir chamber from passing into said upper oil chamber, said means comprising first seal means sealingly engaging said piston rod at a position above said rod guide, for preventing said oil passing through said clearance from said upper oil chamber from escaping from said second passage means, and second seal means having a downwardly extending flexible annular projection having a radially inner surface which sealingly engages said radially outer valve seat-forming surface of said upwardly extending annular projection of said rod guide, whereby said oil passing through said clearance from said upper oil chamber will deflect said annular projection of said second seal means away from said valve seat and will pass to said reservoir chamber, but whereby gas from said reservoir chamber will force said annular projection of said second seal means against said valve seat and thereby seal said second passage means.

4,108,288

CURRENT COLLECTOR SHOE SUSPENSION FOR EXTERNALLY POWERED ELECTRIC VEHICLE

Katsushi Manabe, Tokyo; Fumio Nakama, Musashino, and Kunio Shibayama, Kobe, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki and Japanese National Railways, Tokyo, both of, Japan

Filed Jul. 6, 1977, Ser. No. 813,384
Claims priority, application Japan, Jul. 6, 1976, 51-80101; Jul. 6, 1976, 51-80102
Int. Cl.[2] B60L 5/38
U.S. Cl. 191—49 6 Claims



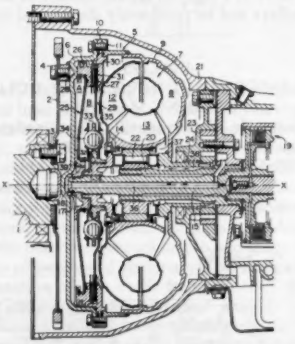
1. In a sliding current collector shoe suspension for an externally powered electric vehicle including at least one current collector with a vibration absorbing assembly pivotally mounted between a current collector shoe and the vehicle for resiliently biasing the shoe toward and into sliding contact with an electric power supply rail, the improvement characterized by: said current collector comprising a plurality of said current collector shoes individually mounted on a common support frame of the vehicle through a like plurality of interconnected vibration absorbing units, each such unit being capable of vibrating independently and said units having different natural resonant frequencies so mutually displaced that their respective vibration characteristic curves overlap.

4,108,289

HYDRAULIC COUPLING WITH A LOCK-UP CLUTCH

Hajime Arai, Aichi, and Kiyoshi Ohnuma, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 21, 1975, Ser. No. 634,040
Claims priority, application Japan, Jul. 16, 1975, 50/86918
Int. Cl.[2] F16H 45/02
U.S. Cl. 192—3.3 10 Claims



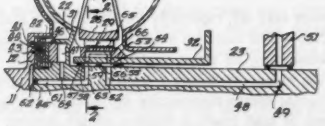
1. A transmission comprising:
an input member;
an output member;
a housing mounted to said input member, said housing defining a cylindrical chamber by a front portion thereof and providing an impeller by a rear portion thereof;
a turbine received in said housing and connected to said output member;
a flexible disc which traverses radially said cylindrical chamber and engages fluid tightly, slidably with an inner wall of said cylindrical chamber thereby dividing said cylindrical chamber into a front first chamber and a rear second chamber;
an annular clutch element which includes a portion projecting radially inwardly from said housing, a radially outwardly projecting flange portion affixed to said housing and an integral intermediate portion;
a clutch disc drivingly connected to said output member and axially displaced from said flexible disc;
said intermediate portion of said annular clutch element extending axially forward over the clutch disc and includes a spline means thereon;
an annular element positioned within said spline means preventing relative rotation and permitting axial movement;
said flexible disc and said annular element being forward of said clutch disc and said portion of said annular clutch element which projects radially inwardly being rearwardly of said clutch disc;
a first fluid passage connected to said first chamber, a second fluid passage connected to said second chamber and at least one opening which traverses said flexible disc to connect said first and second chambers;
said opening having a throttling ratio which generates a predetermined pressure difference between said first and second chambers when fluid flows from said first chamber to said second chamber, whereby as the fluid pressure in the first fluid chamber is increased, the fluid pressure in the second fluid chamber is relieved and the opening between the first and second chambers permits a gradual, throttled change in the fluid pressures.

4,108,290

HYDRAULIC TORQUE CONVERTER LOCK-UP CLUTCH

Walter Fisher, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 12, 1976, Ser. No. 741,258
Int. Cl.[2] F16H 41/18
U.S. Cl. 192—3.3 3 Claims



1. A hydraulic lock-up clutch for a torque converter of an automotive vehicle transmission wherein the torque converter includes an impeller operatively connected to an engine input, a turbine operatively connected to an output means, and a stator operatively connected to a stator shaft through a one-way clutch, positive locking means for selectively and drivingly coupling the impeller and turbine to permit the engine input to directly drive said output means and including interleaved clutch plates alternately operatively connected to said engine input and said output means and a hydraulically operated piston actuating said clutch plates, and a two-position rotary valve communicating with said locking means and slidably mounted on the surface of said stator shaft and generally radially aligned with said stator, said rotary valve providing an inner race and said stator providing an outer race for said one-way clutch, an inwardly extending lug on said rotary valve, said stator shaft having a recess receiving said lug and

providing a pair of spaced stops therefor, a compression spring having one end engaging said lug and the opposite end engaging a recess in said stator shaft to yieldably bias the rotary valve in one direction of rotation to a first position resulting in lock-up of said clutch plates, said rotary valve having a first passage adapted to communicate with a source of hydraulic pressure and said piston and a second passage adapted to relieve the hydraulic pressure behind said piston, passages being in radial alignment with said one way clutch, said rotary valve being operated by said one-way clutch and actuated by the stator reaction force from the torque converter, torque multiplication.

4,108,291

POWER TAKE OFF WITH CLUTCH AND BRAKE

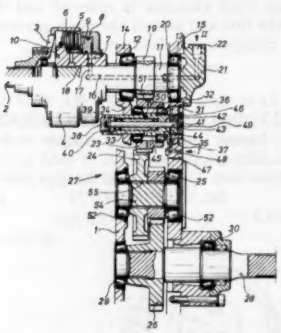
Walter Zenker, Bensberg-Refrath, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 17, 1976, Ser. No. 686,951

Claims priority, application Fed. Rep. of Germany, May 21, 1975, 2522411

Int. Cl.[2] F16D *67/04*

U.S. Cl. 192—4 R **9 Claims**



1. A power take off, especially for agricultural and construction vehicles which includes a housing and transmission means therein connecting an input shaft with an output shaft, said transmission means including a train of meshing gears, a supporting journal means stationarily mounted in the housing for at least one of said gears, a friction clutch having input and output parts interposed between the input shaft and a first of said gears and normally biased toward disengaged position and engageable by fluid pressure means, brake means including a brake body engageable with the output part of said clutch and normally biased toward engaged position, said brake means being moveable in a direction parallel to the axis of said clutch, guiding means for said brake means embodied in said journal means, and fluid operable means connected to the brake means for movement thereof in disengaging direction to move said brake body away from the output part of said clutch, the said journal means comprising a tubular element, said brake means including a rod extending axially through and guided by said tubular element, said brake body being connected to one end of said rod and said fluid operable means being connected to the other end of said rod, and a spring within said tubular element acting on said brake means and comprising the means for biasing said brake means toward engaged position.

4,108,292

CLUTCH APPARATUS

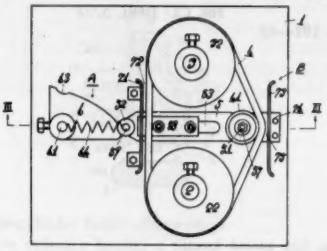
Hazime Takano, 9-15, 4-chome, Kamihozumi, Ibaragi City, Osaka Pref., Japan

Filed Dec. 20, 1976, Ser. No. 752,664

Claims priority, application Japan, Dec. 21, 1975, 50/153129; Jun. 30, 1976, 51-78087

Int. Cl.[2] F16D *13/76, 67/00*

U.S. Cl. 192—11 **4 Claims**



1. A clutch apparatus comprising a driving pulley, a driven pulley spaced laterally from said driving pulley, a belt loosely engaged around said pulleys and having a length sufficient for causing the belt to be completely spaced from the peripheries of said driving and driven pulleys when the runs of the belt between the driving and driven pulleys are straight and substantially tangential to the peripheries of the driving and driven pulleys, a tension pulley, shifting means on which said tension pulley is mounted and movable generally transverse to the line between the axes of said driving and driven pulleys in one direction with the tension pulley in engagement with one of the runs of said belt for tensioning said belt into engagement with said driving and driven pulleys and movable in the opposite direction for releasing the tension on said belt, and belt holding means positioned along the outer side of the belt runs between the driving and driven pulleys when said tension pulley is moved to a position for releasing the tension on the belt for holding the runs of the belt between the driving and driven pulleys substantially straight and tangential to the peripheries of said driving and driven pulleys, whereby the portions of the belt moving along said runs are prevented from bulging outwardly relative to the circumference of the belt and portions of said belt moving around the driving and driven pulleys are caused to bulge outwardly relative to said driving and driven pulleys and be completely disengaged therefrom.

4,108,293

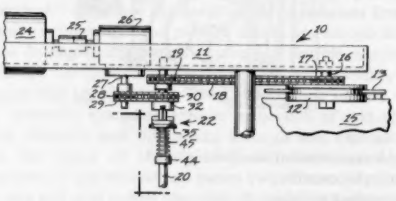
DRIVE DISCONNECT DEVICE FOR A CLOTH SPREADING MACHINE

Joe M. McHenry, Jr., Hendersonville, Tenn., assignor to Cutters Machine Company, Inc., Nashville, Tenn.

Filed Jan. 24, 1977, Ser. No. 761,814

Int. Cl.[2] B60L *5/12*

U.S. Cl. 192—67 R **4 Claims**



1. In a cloth spreading machine having a machine frame supported on wheels, including a drive wheel, for rolling

movement on a cutting table, and drive motive means on the frame, a drive disconnect device comprising:

(a) a rotary drive shaft drivingly connected to said drive wheel,

(b) an elongated key of limited length having an inboard end and an outboard end and fixed upon said shaft parallel to the rotary axis of said shaft,

(c) a first rotary clutch member having a first clutch face, freely rotatable upon said drive shaft outboard of the outboard end of said key, and drivingly connected to said motive means,

(d) a second rotary clutch member having a second clutch face for driving engagement with said first clutch face, said second clutch member being normally rotatable upon said drive shaft inboard of said first clutch member,

(e) an axial keyway in said second clutch member adapted to receive said key when axially aligned with said key for non-rotatable, axial movement of said second clutch member relative to said shaft, and

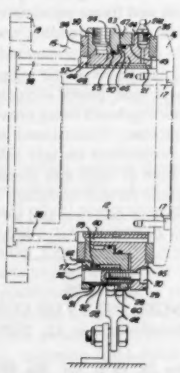
(f) spring means on said shaft constantly biasing said second clutch member toward said first clutch member and into frictional engagement with the inboard end of said key in an inoperative position in which said keyway is disaligned with said key.

4,108,294

ROTARY FLUID COUPLINGS

John Stewart, and Roger Charles Stevens, both of Twickenham, England, assignors to Twiflex Couplings Limited, England

Filed Mar. 1, 1976, Ser. No. 662,826
Int. Cl.[2] F16D *25/00*; E03B *1/00*
U.S. Cl. 192—85 R **9 Claims**



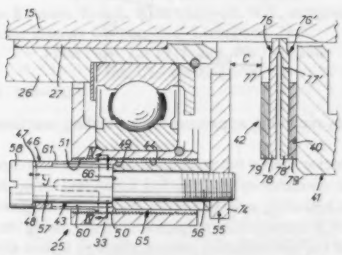
1. A rotary fluid coupling for interconnecting stationary and rotary fluid lines comprising a rotary shaft having two axially spaced, axially directed, annular abutment surfaces which face each other, said abutment surface being concentric with said shaft; an axially expandable outer member which encircles the shaft between said two abutment surfaces, there being provided a space for receiving fluid betwen the shaft and the outer member, and respective fluid passages extending within the shaft and the outer member leading to said space for respective connection to rotary and stationary fluid lines; means for preventing rotation of said outer member about the axis of the shaft; and respective releasable first annular sealing means located between each abutment surface on the shaft and an adjacent axial end surface of the outer member for preventing leakage of fluid from said space when the outer member is expanded; the outer member comprising two coaxial annular members which are disposed one within the other for axial movement with respect to each other and to the rotary shaft, each annular member having a respective axial annular end face which is disposed for sealing engagement with the respective one of said first annular sealing means when the outer member is axially expanded, a first of said annular members having an axial bore within which the shaft is rotatably disposed and an outer surface of which the diameter increases in one axial direction, the second annular member having an axial bore of which the diameter increases in correspondence with that of said outer surface of the first annular member in the same axial direction, said outer surface of the first annular member being disposed within the axial bore in the second annular member, there being provided two axially spaced second annular sealing means located within said bore in the second annular member which are sealingly engaged between said outer surface of the first annular member and the wall of the bore in the second annular member whereby a fluid actuation chamber is provided between said axially increasing surfaces and between said sealing means, and means for supplying pressurized fluid between the first and second annular members between said second annular sealing means to urge said two annular members apart thereby to expand the outer member.

4,108,295

INERTIA-BRAKE CONTROL FOR INPUT SHAFT OF GEAR BOX, AND ITS APPLICATION TO CLUTCHES AND UNITS FORMED BY A CLUTCH AND A GEAR-BOX

Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Feb. 6, 1976, Ser. No. 655,964
Claims priority, application France, Feb. 11, 1975, 75 04156
Int. Cl.[2] F16D *13/75*
U.S. Cl. 192—111 A **22 Claims**



4. An operating control for an inertia brake for an input shaft of a gear-box, of the kind including a gear box casing, a clutch for coupling said input shaft to a drive unit, a declutching stop carried by said input shaft for declutching said clutch, a friction disc keyed on said input shaft for rotation therewith and for axial sliding thereon, said gear-box casing having a reaction surface engageable by said friction disc, pressure means carried by said declutching stop and adapted, in response to an axial displacement of said declutching stop in a clutch declutching direction, to apply against said reaction surface said friction disc, said brake operating control further comprising unidirectional axial coupling means provided between said declutching stop and said pressure means carried by said declutching stop, said unidirectional axial coupling means being operable on the one hand to permit controlled axial displacement of the pressure means with respect to said declutching stop in the direction opposite to the clutch declutching movement of said declutching stop and on the other hand to prevent such axial displacement, and retaining means positioned for engagement by said pressure means when the declutching stop carrying said pressure means is displaced in the direction opposite to its clutch declutching movement, said declutching stop having a bore rigidly fixed thereon parallel to the axis of said input shaft, said pressure means comprising at least one action finger engaged in said bore, said unidirectional axis coupling means comprising a threaded portion of the cam-engaged ratchet type, rigidly fixed on a selected one of the declutching stop and action finger, and a split socket interposed between said action

finger and the bore in which said action finger is engaged and which has a threaded portion complementary to said first-mentioned threaded portion, said socket being further provided with a radial supporting surface cooperating in abutment with a shoulder fixed on the non-selected one of said declutching stop and action finger, and a conical support surface cooperating by wedging action with a complementary bearing surface fixed on said non-selected one of said declutching stop and action finger.

4,108,296

COIN RECEIVING APPARATUS FOR A VENDING MACHINE

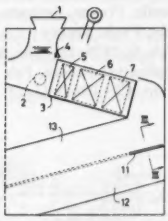
Yukichi Hayashi; Masayuki Tamura; Osamu Sugimoto, all of Sakado; Masayoshi Takizawa, Kitamoto, and Tatsujiro Nishioka, Yokohama, all of Japan, assignors to Nippon Coinco Co., Ltd., Japan

Filed Mar. 22, 1977, Ser. No. 780,153

Claims priority, application Japan, Apr. 8, 1976, 51-39580; Apr. 23, 1976, 51-46262; May 14, 1976, 51-61095[U]

Int. Cl.[2] G07F *3/02*

U.S. Cl. 194—99 **5 Claims**



1. A coin receiving apparatus for a vending machine comprising:

coin detector means for producing an output corresponding to the diameter of an inserted coin, said coin detector means including a coil so arranged that the magnetic flux thereof is substantially perpendicularly crossing the diameter of the inserted coin passing through a coin detection path;

one or more coin detector means of a differential transformer type sequentially arranged adjacent to said coin detector means in the coin detection path for producing an output corresponding to coin characteristic or characteristics other than the coin diameter;

detection control means for controlling said respective coin detector means and judging whether the inserted coin is true or false in response to the detected outputs from said respective coin detector means, said detection control means comprising a supply source for selectively supplying an exciting power of a frequency corresponding to said respective coin detector means, control means for controlling the selective supply of the power from said supply source to said respective coin detector means in a sequential order corresponding to passage of the inserted coin through said respective coin detector means in the coin detection path thereby to cause said respective coin detector means to successively detect the inserted coin, and discriminating means for discriminating a peak level of the detected output of each of said respective coin detector means; and

coin receipt control means responsive to the true or false judgement output from said detection control means for controlling the receipt or return of the inserted coin; whereby the inserted coin is received in the coin receiving apparatus if the detected outputs from all of said coin detector means indicate that the inserted coin is true.

4,108,297

GUIDE FOR A PRINTING HEAD OF A PRINTING DEVICE

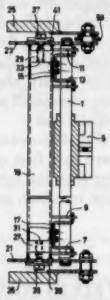
Heinrich Dürr, Wilnsdorf-Niederdielfen, and Lothar Haubrich, Eiserfeld, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,880

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618001

Int. Cl.[2] B41J *29/02*

U.S. Cl. 400—354 **4 Claims**



1. A printing device which comprises: a frame; a printing head; and a guide for limiting displacement of said printing head parallel to a predetermined printing direction, said guide comprising two parallel round guide rods, first and second guide plates carried on said frame proximate both ends of said guide bar of said side plates extending transversely of said guide rods, said guide rods being connected to the side plates by means of a supporting beam which extends parallel to the printing direction, said side plates including a plurality of projections, said supporting beam being provided on each of its end faces with (1) recesses dimensioned and configured to cooperate with said projections on said side plates, and also with (2) a threaded hole at each end thereof which extends longitudinally, said guide further including a first and second bolts respectively coupling said first and second side plates to said threaded holes in said supporting beam.

4,108,298

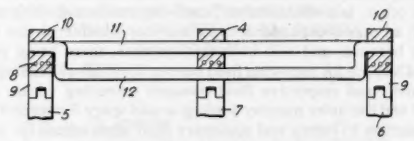
SIEVE STRINGER BELT FOR CONVEYORS

Helmut Klinkicht, Bahnhofstrasse 12, 2000 Barsbuttel, Fed. Rep. of Germany

Filed May 24, 1976, Ser. No. 689,243

Int. Cl.[2] B65G *17/00*

U.S. Cl. 198—834 **7 Claims**



1. A belt conveyor arrangement, particularly for conveyors of substantially large width comprising, in combination, lateral belts with reinforcing insert means and spaced from each other along the width of the conveyor; at least one supporting belt between said lateral belts, at least one of said belts being a drive belt and having a driving surface, a drive wheel engaging said driving surface for driving said drive belt, said driving surface facing said drive wheel and having a toothed-rack shape; transverse elements connected to said lateral belts and supported by said supporting belt; pot-shaped sleeves mounted on the ends

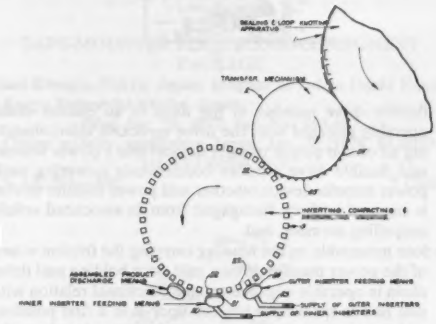
of said transverse elements and inserted into said lateral belts, said sleeves being seated in said lateral belts and carrying said transverse element; said sleeves comprising a disc at one end; a ring-shaped member at the other end; and individual rods connected between said disc and said ring-shaped member, the external diameter of said disc being substantially larger than that of the remaining portion of said sleeve.

4,108,299

APPARATUS AND METHOD FOR DELIVERING TAMPON SACKS AND INSERTER PARTS TO AN ASSEMBLY TURRET

John George Mast, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 531,222, Dec. 10, 1974, Pat. No. 4,006,515.
This application Jun. 21, 1976, Ser. No. 698,274
Int. Cl.[2] B65G *47/00*
U.S. Cl. 28—119 **17 Claims**



1. Apparatus for feeding tampon inserters to a tampon assembly turret, a rotatable feeder wheel inclined at an angle of substantially 45°, said wheel comprising spaced inner and outer discs having mating sets of slots therein, drive means for rotating said wheel, holder means overlying said feeder wheel for feeding inserter parts to said wheel, said holder means having a slotted bottom positioned to receive the inserter parts and align them for engagement by the sets of slots in said inner and outer discs, said discs passing through the slotted bottom of said holder means, coacting hold-down rods positioned to maintain the inserter parts in said sets of slots, and mens for transferring the inserter parts from said wheel to the assembly turret.

4,108,300

BAG PACKING APPARATUS

Masao Hayase, Kasugai, and Kazunori Araki, Gifu, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

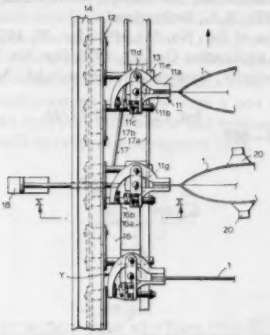
Filed Aug. 10, 1977, Ser. No. 823,450
Int. Cl.[2] B65G *19/02;* B65B *43/30*
U.S. Cl. 198—479 **1 Claim**

1. An apparatus for packing bags comprising:

a pair of horizontally-spaced, parallel chain conveyors;

a plurality of paired attachement-rods positioned opposite each other on said chain conveyors and projecting toward each other;

clamping means slidably mounted on said attachment-rods for clamping and holding the sides of said bags between said conveyors; and



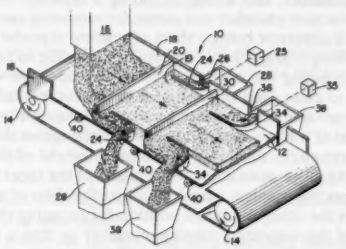
guide means adjacent said clamping means for sliding said clamping means on said attachment-rods toward and away from said conveyors.

4,108,301

MULTIPLE POINT FEEDER

Norman Kenneth Trozzi, West Caldwell, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 12, 1976, Ser. No. 741,256
Int. Cl.[2] B65G *15/00*
U.S. Cl. 198—633 **6 Claims**



1. A material handling system for distributing granular solids from a single source to a multiplicity of points, comprising:

a conveyor for transporting the material from a feed source;

a plurality of pairs of arcuate-shaped deflectors, each pair of deflectors being spaced longitudinally along and adjacent the sides of said conveyor for diverting quantities of material toward the sides of said conveyor;

a hopper disposed adjacent to each of said deflectors for receiving the diverted quantity of material; and

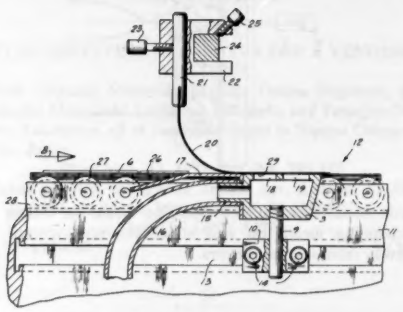
a plurality of leveling bars positioned above said conveyor for controlling the thickness of the layer of material on said conveyor, said leveling bars being alternately spaced in the longitudinal direction with respect to said pairs of deflectors to redistribute on the conveyor the material remaining downstream of each pair of said deflectors to provide a layer of material of uniform thickness,

whereby the cooperative relationships among the vertical positions of the leveling bars and the lateral positions of the deflectors accurately control the precise amounts of material diverted from the conveyor to said hoppers.

4,108,302
SUCTION CONVEYOR

Friedrich Wiedemann, St- Sulpice, Switzerland, assignor to J. Bobst & Fils, S.A., Switzerland

Continuation of Ser. No. 561,949, Mar. 25, 1975, abandoned.
This application Oct. 22, 1976, Ser. No. 735,055
Claims priority, application Switzerland, Mar. 27, 1974, 4368/74
Int. Cl.[2] B65G *17/46*
U.S. Cl. 198—689 3 Claims



1. In a conveyor device having a belt conveyor with a conveying surface and at least two separate vacuum chambers communicating with a single source of vacuum, each vacuum chamber having a wall with an outer surface and at least one opening extending therethrough, each vacuum chamber being disposed adjacent the belt conveyor with the outer surface lying substantially in the plane of the conveying surface for applying a holding force on a blank being transported by the conveying surface thereacross, the improvement comprising means for controlling the flow through each opening of each vacuum chamber, said means including a separate obturator for each vacuum chamber and means for mounting each obturator, each obturator being a sheet of resilient material having one end being engaged by the means for mounting and another end for engaging the outer surface of its respective vacuum chamber to close each of the openings therein and being displaced from the outer surface and each opening therein by movement of a blank along the outer surface across the opening, said means for mounting holding the one end of the sheet of each obturator at an angle to the plane of the outer surface of its respective vacuum chamber so that the sheet of material self-biases the other end into a position for engaging the outer surface of the respective vacuum chamber so that a moving blank passes over an opening at one of the vacuum chambers, suction is applied thereto and as the moving blank uncovers each opening of the vacuum chamber, the obturator associated therewith blocks flow through each of the uncovered openings into the vacuum chamber.

4,108,303
POWER TRANSMISSION ASSEMBLY FOR AN ACCUMULATOR CONVEYOR

Robert K. Vogt, and Martin A. Heit, both of Cincinnati, Ohio, assignors to The E. W. Buschman Company, Cincinnati, Ohio

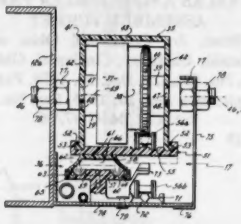
Filed Aug. 2, 1976, Ser. No. 710,442
Int. Cl.[2] B65G *13/02*
U.S. Cl. 198—781 9 Claims

4. An accumulator conveyor of the type having a plurality of separate zones between the inlet end and the discharge end thereof, said conveyor comprising

at least one article propelling member connected to said conveyor within each zone, said article propelling member being in the form of a roller rotationally mounted to said conveyor powering an article resting thereon within said zone thereacross from the adjacent upstream zone to the adjacent downstream zone, the rollers being in spatial relation relative one to the other,

a separate power transfer device including a friction wheel rotationally carried in a housing pivotally mounted to said conveyor for each zone associated with said article propelling member, said power transfer device being selectively engageable with and disengageable from said article propelling member for selectively operating said article propelling member, a drive sprocket connected to said friction wheel,

means for moving each of the power transfer devices to bring the friction wheel thereof into engagement with and into disengagement from the associated article propelling member,



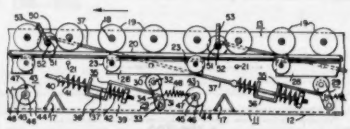
a flexible drive member in the form of an endless chain operably engaged with the drive sprockets interconnecting all of said power transfer devices and a power source, said flexible drive member continuously powering each power transfer device whether said power transfer device is engaged with or disengaged from its associated article propelling member, and

a door mountable on the housing carrying the friction wheel of the power transfer device, said door holding said drive chain in operable engagement and functional relation with said power sprocket when the door is in a first position, said door being movable to a second position to release the drive chain and permit disengagement of said drive chain from said power sprocket and said housing.

4,108,304
POWERED ROLLER ACCUMULATION CONVEYOR

Robert J. McKnight, Toms River; Frank J. Neuwirth, Manasquan, and Robert W. Gotham, Toms River, all of N.J., assignors to Unex Conveying Systems, Inc., Jackson, N.J.

Continuation of Ser. No. 713,092, Aug. 10, 1976, abandoned.
This application Feb. 21, 1978, Ser. No. 879,537
Int. Cl.[2] B65G *13/02*
U.S. Cl. 198—781 31 Claims



1. An accumulation conveyor comprising a pair of laterally spaced siderails, each having a normally vertical web, a plurality of axles extending between said siderails, a roller rotatably mounted on each axle and adapted to carry articles to be transported by said conveyor, a power-driven propelling member, a plurality of vertically movable rollers supporting the propelling member with adjustable first mechanical means cooperating therewith for urging said rollers upward against the propelling member, said first mechanical means being resilient, and means for detecting the presence of an article on said conveyor, said means being operatively connected to an adjustable second mechanical means which cooperates with said verti-

cally movable rollers for urging a plurality of said rollers selectively either upward or downward to further vary the pressure of said vertically movable rollers against the propelling member by exerting a supplementary force on said vertically movable rollers, said secondary mechanical means including a movable cam means adapted to selectively bias said vertically movable rollers against said propelling member, said secondary mechanical means further including an adjustable tension spring means attached to said cam means and adapted to regulate the bias exerted by said vertically movable rollers against said propelling member, said second mechanical means further including an actuator assembly interconnecting said cam means with said article detecting means and comprising:

a. a slidable member;

b. a rod means slidably secured with respect to said slidable member, said rod means including a first stop means and a second stop means thereon; and

c. a first compression spring means positioned about said rod and abutting said slidable member, said first compression spring means positioned between said second stop means and said slidable member to bias said slidable member with respect to said rod member.

4,108,305

TAPE-MOUNTED ELECTRONIC-COMPONENT PACKAGE

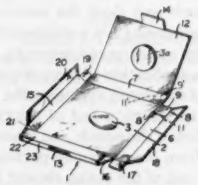
Kisao Komatu, Tokyo, Japan, assignor to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Jan. 28, 1977, Ser. No. 763,487

Claims priority, application Japan, Jan. 30, 1976, 51-9077

Int. Cl.[2] B65D *73/02*

U.S. Cl. 206—330 **7 Claims**



1. A box blank for a package for feeding a spirally-wound support tape carrying electronic components held to said support tape by lead wires disposed transversely to said support tape, comprising an essentially square bottom section, a back face and a front face at two opposed edges of said bottom section, said back and front faces each having two edges, first and second side faces at the remaining edges of said bottom section, score lines between each of said faces and said bottom section, each of said side faces having two ends and two edges, an end flap at each end of said first side face, a score line between each of said end flaps and said first side face, a single end flap at that end of said second side face nearer said front face, a score line between said single end flap and said second side face, a cover section of essentially the same size and shape as said bottom section at an edge of said back face, a score line between said cover section and said back face, a tongue at the edge of said cover section opposite that adjacent to said back face, a score line between said tongue and said cover section, a top support flap at an edge of each of said side faces, a score line between each of said side faces and the respective top support flap, a top support section and an inside front face in sequence at said front face, score lines between said front face and said top support section and between said top support section and said inside front face, said top support section having a slot therein for receiving said tongue on said cover section to hold said cover section in closed position when said box blank is assembled, all of said score lines being positioned for folding an inward direction, one of that end of said back face nearer said second side face and that end of said second side face nearer said back face each having a score line transverse to the edges thereof and a short distance from each said that end positioned for folding outward and the edges of said back face and said side face being cut through from said that end to said transverse score line for forming a hinged flap which can open outwardly from said box either from said back or said side face when formed from said box blank for permitting feed of spirally-wound contents from a box made from said blank, and an axial core attached to said bottom section for use in holding said spirally-wound support tape.

4,108,306

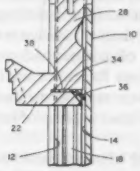
CARTRIDGE FOR SUTURE CLIPS

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest C. Wood, 2461 Ivanhoe Dr., Los Angeles, Calif. 90039

Filed Jun. 20, 1977, Ser. No. 807,967

Int. Cl.[2] B65D *85/20*

U.S. Cl. 206—339 **2 Claims**



1. A cartridge for feeding pairs of clips simultaneously in laterally spaced apart relation from an elongate housing having a central passage,

a pair of slots extending through at least the major portion of the housing with a passage in between for receiving a plurality of clips in each slot aligned in end to end relation, with the slots communicating with the central passage through a contiguous opening of smaller dimension than the slots and passage,

a slide within the passage, and arms extending laterally from the slide through the openings into the slots for engagement with the endmost of the clips in the slots,

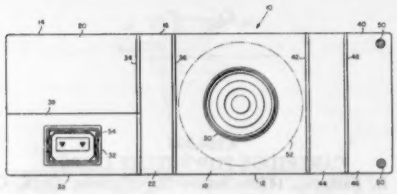
a handle extending from the housing and operatively connected with the slide for endwise displacement through the passage, the improvement in a

means to permit the slide to move forwardly while preventing rearward movement in the passage comprising a spring clip having a forward end portion received within a slot extending inwardly from the wall of the slide opposite the handle and a trailing end portion which extends beyond the slide into engagement with the adjacent wall of the housing, with the trailing end portion being angled to extend backwardly to permit forward movement of the slide relative to the housing while preventing relative backward movement, in which the spring clip comprises a flat strip of spring metal in which the forward portion is dimensioned to have a length corresponding to the length of the slot in the slide and a trailing portion in which the total length of the strip is greater than the distance between the base of the slot to the adjacent wall of the housing for resilient engagement between the clip and the wall.

4,108,307
STORAGE BINDER

Irene B. Feingold, and Stanley Z. Feingold, both of 420 Pitts Colony Dr., Rochester, N.Y. 14623

Filed May 11, 1976, Ser. No. 685,176
The portion of the term of this patent subsequent to Aug. 16, 1991, has been disclaimed.
Int. Cl.[2] B65D *85/672*
U.S. Cl. 206—387 2 Claims

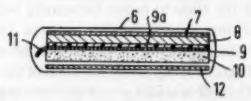


1. A storage binder for audiovisual material comprising:
(a) a first generally rectangular cover member having an inner and an outer surface,
(b) first mounting bracket means affixed to the inner surface of said first cover member and centered thereon for securing a circular photographic slide tray thereto by friction engagement therewith,
(c) a second generally rectangular cover member having an inner and an outer surface including a storage pocket on the inner surface thereof, said storage pocket extending from the bottom of said second cover member upward and extending across the entire width of the inner surface of said second cover member to thereby cover a substantial portion of the inner surface of said second cover member,
(d) second mounting bracket means affixed to said storage pocket for securing an audio cassette thereto by friction engagement therewith, and
(e) a spine member joining said first and second cover members in a hinged relationship.

4,108,308
PACKAGE FOR INTRAORAL DENTAL X-RAY FILMS

Kurt Franke; Johannes Seissl, and Wilhelm Stuermer, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 5, 1976, Ser. No. 739,136
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 7535699
Int. Cl.[2] B81D *81/20;* B03B *41/18*
U.S. Cl. 206—455 2 Claims

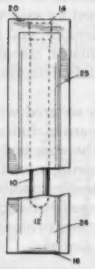


1. An X-ray film package for preparation of intraoral dental X-ray photographs comprising in combination, a pouch having an interior chamber, a sheet of X-ray film having an emulsion layer and positioned within such chamber, and an intensifier foil comprising two surfaces, a photo-luminescent layer on one surface thereof and an adhesive layer coated on another surface thereof, said adhesive coated surface of the intensifier foil being in intimate contact with said emulsion layer and said adhesive coated surface allowing separation of said film and said intensifier foil.

4,108,309
CONTRACEPTIVE CONTAINING DEVICE

Emanuel H. Bronner, Escondido, Calif., assignor to All One God Faith, Inc., Escondido, Calif.

Continuation-in-part of Ser. No. 732,800, Oct. 13, 1976, Pat. No. 4,027,670. This application Mar. 21, 1977, Ser. No. 779,489
Int. Cl.[2] A61J *3/08;* B65D *77/38*
U.S. Cl. 206—528 6 Claims

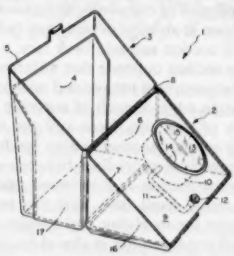


1. A contraceptive containing device, comprising a contraceptive gel having a pH less than 3.0;
an elongated casing containing the gel, and having an insertion end extending beyond the gel wherein said insertion end has an outer portion, and an inner portion between said outer portion and said gel; and
a hygenically sealed pouch enclosing the casing and having a seal at one end of the pouch which overlaps said outer portion of the insertion end of the casing to secure the casing to the pouch and close the insertion end of the casing; wherein said casing has a weakened region in said inner portion of the insertion end, whereby the casing can be exposed by the application of shear stress at a region in at least one side of the pouch excluding the pouch portion which overlaps the insertion end of the casing to allow removal of a portion of the pouch, and wherein said casing can be removed from the remaining portion of the pouch by pulling on the end of the casing remote from the insertion end to provide a shearing stress in the casing near the insertion end of the pouch for causing said casing to detach from said remaining portion of the pouch.

4,108,310
BLOOD PRESSURE TESTING KIT

Clarence Foster Aldridge, Asheville; Leo Martin Storey, Jr., Biltmore Forest, and Joseph William Cilurzo, Hendersonville, all of N.C., assignors to Sybron Corporation, Rochester, N.Y.

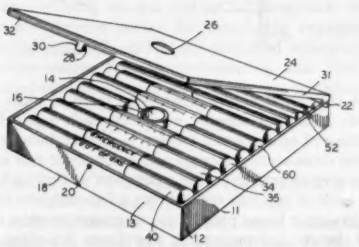
Filed Mar. 2, 1976, Ser. No. 663,034
Int. Cl.[2] B65D *69/00*
U.S. Cl. 206—570 2 Claims



1. A blood pressure testing kit comprising, in combination, a case and blood pressure testing apparatus,

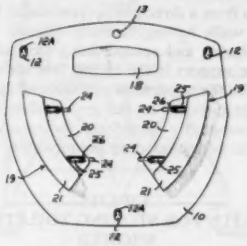
(a) said case having a first commpartment and a second embodiment;
(b) said blood pressure testing apparatus including a cuff element, a valve element, a bulb element, and pressure coupling and tubing elements;
(c) said blood pressure testing apparatus also including a stethoscope and a pressure gauge couplable by said pressure coupling and tubing elements to other said elements;
(d) said stethoscope and said cuff element being receivable in said first compartment for storage therein, and said pressure gauge being mounted in said second compartment for observation;
(e) said case comprising a hollow shell having an open side for providing said first compartment, a lid having an open side for providing said second compartment and for covering the first said open side, and a hinge securing said lid to said shell;
(f) said hinge providing for swinging said lid about said hinge from a closed position wherein one of said compartments substantially closes the other, to an open position exposing the contents of said compartments to simultaneous external manual and visible access from the same point of view in the external environment and for holding said lid in either said position;
(g) said shell having a flat bottom, said lid having a flat top, and in open position said flat bottom and said flat top being substantially coplanar;
(h) said second compartment having a flat plate closing it, the plane of said plate running diagonally of said lid and having the axis of said hinge therein, and said pressure gauge having a substantially planar reading area coplanar with said plate.

4,108,311
SAFETY WARNING KIT
Gilbert McClendon, 1540 N. Carey St., Baltimore, Md. 21217
Filed May 11, 1977, Ser. No. 795,741
Int. Cl.[2] B65D *79/00*
U.S. Cl. 206—573 **10 Claims**



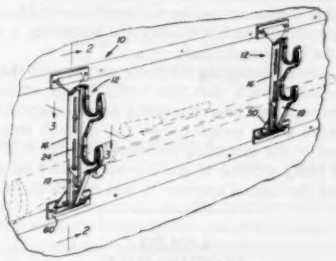
1. A highway safety warning kit comprising:
a. a container having a body and a cover fitted thereto, the cover defining a thru hole centrally thereof, and the body providing an opening aligned with the hole,
b. a long post which may be fitted into the hole and the opening, the post defining a first opening adjacent one end thereof and a second opening somewhere along the length of the post, and
c. at least one sign comprising a rolled up flat extension spring and attached therealong a flat flexible material having at least four edges, adjacent a first edge of which is provided with a first fastening means, and adjacent a second, distal edge of which is provided a second fastening means, all said fastening means engaging the respective openings in the post,
the combination of the post erected into the container and the sign attached to the post thereby displaying the sign.

4,108,312
HANGER FOR RACQUETS
Charles G. Craven, 35 Will Dr., Canton, Mass. 02021
Filed Jun. 30, 1976, Ser. No. 701,163
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—13 **4 Claims**



1. A hanger for a plurality of racquets, said hanger comprising a back plate attachable to a door or wall and a pair of holders transversely spaced on said back plate to receive between them depending racquet handles, each holder including a supporting wall and inner and outer retaining walls parallel to the plate and disposed towards the opposite holder, the outer retaining wall spaced from the plate a distance such that said heads are freely received and loosely held by and between said holders, the supporting wall of each holder shaped to be engaged by a major portion of the head of a racquet that curves inwardly from the zone of maximum width towards its handle and the outer wall dimensioned to overlie the margins of the head throughout at least a major part of said portion, and means connecting the inner wall of each holder to the back plate with the inner wall seated thereagainst, said connecting means of each holder including a vertically spaced pair of parallel horizontally slidable connections, to enable the holders to be slid towards and away from each other between predetermined proximate and remote spaced apart relationships as required for the accommodation of racquet heads within a predetermined width range.

4,108,313
VEHICLE MOUNTED GUN RACK WITH MOUNTING BRACKETS
Earl M. Bogar, Jr., P.O. Box 4152, Houston, Tex. 77001
Filed May 12, 1977, Ser. No. 796,474
Int. Cl.[2] A47F *5/08, 7/00*
U.S. Cl. 211—64 **6 Claims**



1. A mounting rack for rifles and the like comprising a pair of laterally spaced support members, each support member comprising:
first and second slide elements, each slide element having means thereon for forming a slidable surface and a substantially planar support blade formed thereon, the plane

of each support blade extending away from the planes of the slidable surfaces of the slide elements at an angle, the first slide element comprising a U-shaped longitudinal channel member forming a slide track, the channel member being comprised of a rear wall and two spaced side walls extending perpendicularly to the rear wall, the second slide element being receivable between the spaced side walls from a direction perpendicular to the rear wall, the side walls having laterally aligned elongated slots formed therein and spaced along free edges of the side walls, the support blade of the first slide element being attached to the uppermost end thereof; and,

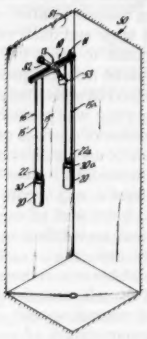
cradle means disposed on the second slide element and extending outwardly therefrom for receiving the object which is to be mounted on the mounting rack.

4,108,314

APPARATUS FOR STORING TOILETRIES IN A SHOWER

Enrico R. Racca, 23 Meadow St., Brooklyn, N.Y. 11206

Filed Oct. 25, 1977, Ser. No. 844,523
Int. Cl.[2] A47K *5/00*
U.S. Cl. 211—74 **12 Claims**



12. An apparatus for storing toiletry bottles within a shower said bottles having a removable screw on cap member comprising:

a mounting member for attaching the apparatus to the plumbing element of the shower;

means for securing said mounting member to the plumbing element of the shower;

a bottle carrier having a central aperture for receiving the neck of one of the toiletry bottles, said aperture having a diameter greater than the exterior diameter of the bottle neck but lesser than the exterior diameter of the bottle cap such that the carrier can be mounted over the bottle neck and secured to the bottle when the bottle cap is screwed onto the bottle neck; and

means for interconnecting the bottle carrier with the mounting member such that the bottle hangs adjacent the shower wall, said interconnecting means comprising a pair of spaced string members one end of each string being secured to the mounting member the other end of each string being secured to the carrier member on opposite sides of the central aperture of said carrier member.

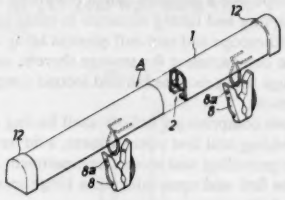
4,108,315

CLOTHES POLE

Satoshi Inao, 646, Hachigasaki, Matsudo-shi, Chiba-Ken, Japan

Filed Jun. 16, 1976, Ser. No. 696,618
Int. Cl.[2] A47H *13/00*
U.S. Cl. 211—124 **1 Claim**

1. A clothes pole assembly comprising a body forming guiding means extending in a longitudinal direction and comprising a pair of upwardly facing spaced apart surfaces and a pair of laterally facing spaced apart surfaces, at least one suspending member comprising a pair of support arms and means for biasing said arms against said laterally facing surfaces, said upwardly facing surfaces constituting means for supporting said arms, said biasing means also comprising means depending from said arms for moving said arms toward and away from



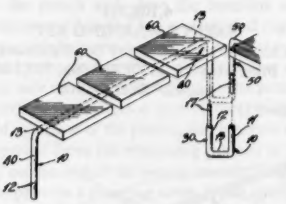
said laterally facing surfaces for moving said suspending member along said guiding means, and means for holding washed clothes including means linking said holding means to said depending means, said laterally facing surfaces and said arms including interfitting concave and convex portions for fixing said suspending member in position along said guiding means.

4,108,316

INTERCONNECTIBLE STRUCTURAL TUBULAR MEMBERS

Norman S. Slater, Montreal, Canada, assignor to Norman Slater, Inc., Montreal, Canada

Filed Mar. 31, 1976, Ser. No. 672,394
Int. Cl.[2] A47F *5/13*
U.S. Cl. 211—199 **3 Claims**



2. A support structure comprising three or more interconnectible structural support members, each support member consisting of an elongated unitary U-shape tubular member of uniform cross-section shape to define opposite side arms and a bridge arm extending across a common end of each said side arms, each of said side arms having a free end, one of said free ends having a hinge plug of circular cross-section rigidly secured thereto and protruding therefrom, the other free ends being hollow and of circular cross-section to receive a hinge plug of a side arm of a further U-shape tubular member, a second one of said support members being hingeably connected to a first and third one of said support members by receiving said hinge plug of a side arm of said first member in said hollow end of a side arm of said second member and having said hinge plug of the other side arm of said second member received in said hollow end of a side arm of said third member, said bridge arm of said second member being supported upwardly of a support surface by said bridge arms of said first and third members which are resting on said support surface, each of said hinge plugs being received in the hollow free end of the respective side arm in close frictional fit to permit axial rotation of respective ones of said interconnected side arms about said hinge plug in said respective hollow end whereby said interconnected ones of said support members will be self-supporting on said supporting surface and displaceable relative to one another and to any desired position when in use, one side arm of said first member being longer than the

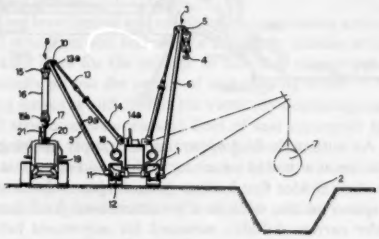
other side arm and substantially equal to the combination of the length of its other side arm and the hingeably interconnected side arm of said second member, one or more lateral support members secured to said bridge arm of said first member and having a planar surface extending transversely to said side arms of said first member.

4,108,317

CONTINUOUS LAYING OF PIPES OF LARGE DIAMETER

Alberto Giovanni Bifani, and Giorgio Maria Bertolino, both of Turin, Italy, assignors to Fiat-Allis Macchine Movimento Terra S.p.A., Lecce, Italy

Filed Apr. 20, 1977, Ser. No. 789,023
Claims priority, application Italy, May 3, 1976, 68072 A/76
Int. Cl.[2] B66C *23/72*
U.S. Cl. 214—1 PA **6 Claims**



1. Apparatus for laying pipe comprising

a first self-propelled vehicle having supported thereon lifting means for engaging an object to be lifted and moved from one position to another position,

said first self-propelled vehicle also having supported thereon balancing means for engaging a counterweight to counterbalance said vehicle when said lifting means engages an object during lifting and moving of the object from one position to another position, and

a counterweighting second self-propelled vehicle having supported thereon means for detachably engaging the balancing means of said first self-propelled vehicle to form a counterweight for counterbalancing said first self-propelled vehicle when lifting and moving an object from one position to another position.

4,108,318

APPARATUS FOR OFFSHORE HANDLING AND RUNNING OF A BOP STACK

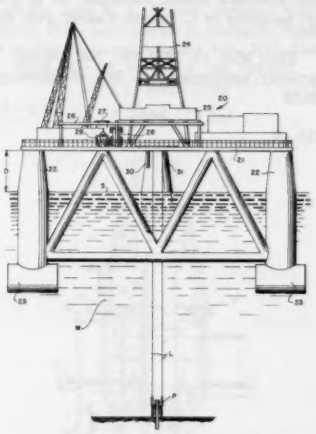
Walter F. Rode, Richardson, and Bill R. Jones, Dallas, both of Tex., assignors to Sedco, Inc. of Dallas, Texas, Dallas, Tex.

Filed Jun. 7, 1974, Ser. No. 477,284
Int. Cl.[2] E21B *3/00*
U.S. Cl. 214—1 R **26 Claims**

1. A system for handling and substantially continuously constraining a BOP stack as it is lowered from a platform on an offshore drilling vessel into a body of water, comprising:

movable lifting means mounted on said platform for lifting and moving said BOP stack from a storage position on said platform to a position where it is in line to be run from said platform to the sea bottom; and

constraining means mounted on said platform for substantially continuously constraining said BOP stack until a substantial portion of said stack is in said body of water and below the splash zone, said constraining means extending downwardly from said platform and terminating above the surface of said body of water a sufficient amount to be above substantial wave action when said vessel is submerged in said body of water at a depth at which BOP running operations are performed, but terminating sufficiently close to the surface of said body of water during such operations to provide constraint against



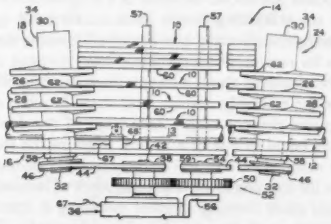
lateral movement of said BOP stack until at least a portion thereof is below said surface.

4,108,319

GLASS ACCUMULATOR

Kenneth J. Kacirek, and Jack E. Rust, both of Fresno, Calif., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 22, 1977, Ser. No. 770,553
Int. Cl.[2] B65G *57/30*
U.S. Cl. 214—6 BA **13 Claims**



1. Sheet accumulator, comprising:

means for advancing a sheet to be stacked along a predetermined path;

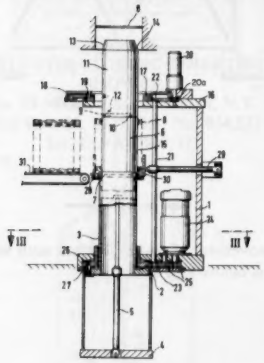
means for engaging marginal edge portions of the sheet at a distance spaced from adjacent peripheral edge portions of the sheet and for maintaining the sheet portions between the engaged marginal edge portions and adjacent peripheral edge portions free of surface contact; and

means for moving said engaging means to displace the sheet by said engaging means relative to the predetermined path while continually maintaining portions between the engaged marginal edge portions and adjacent peripheral edge portions of the sheet free of surface contact during sheet displacement.

4,108,320
ALIGNING AND STAMPING ARRANGEMENT

Alfred Bareis, Uhingen; Karl Dangelmaier, Göppingen-Holzheim, and Reinhard Braun, Eislingen, all of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,940
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610123
Int. Cl.[2] B65G *57/16*
U.S. Cl. 214—8 18 Claims



1. An arrangement for aligning and stacking of laminations and for transporting formed stacks of laminations, the laminations having stamped patterns defining a plurality of stampings distributed in a circular configuration about the laminations at equal centering angles, the arrangement comprising:

a stack forming means for receiving laminations fed individually thereto in the same position including at least two stack forming members mounted so as to be selectively separable, said at least two stack forming members being disposed one above the other in a longitudinal direction of the stack forming means so as to form an upper stack forming member and a lower stack forming member,

means for rotatably mounting said stack forming means so as to be rotatable about a longitudinal axis thereof,

means for rotatably driving said stack forming means in a stepwise manner with rotary steps of the driving means being equal to one of a central angle of the stampings of the stamped pattern and a whole number multiple thereof,

means for forming an intermediate stack of laminations at the upper stack forming member including at least one intermediate stack forming member selectively displaceable into and out of an intermediate stack forming area, the stack forming area surrounding the stack forming means at least in an area of the upper stack forming member,

wherein the upper stack forming member is provided with means for accommodating said at least one intermediate stack forming member so as to grip said upper stack forming member and hold the same in a given position,

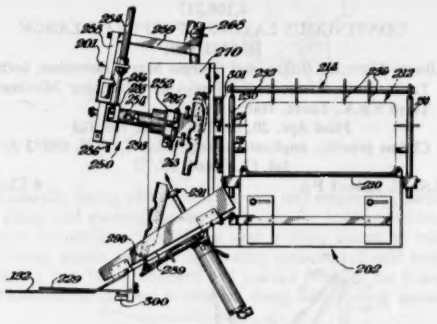
means for rotatably mounting said intermediate stack forming means, and

means for operatively connecting said intermediate stack forming means with said driving means such that said intermediate stack forming means is rotatably driven in a stepwise manner with rotary steps being equal to one of the central angle of the stampings of the stamped pattern and a whole number multiple thereof.

4,108,321
AUTOMATIC PACKING

Louie Russell Lowery, Madison, N.J., assignor to Keyes Fibre Company, Waterville, Me.

Filed Sep. 2, 1976, Ser. No. 719,846
Int. Cl.[2] B65G *59/10*
U.S. Cl. 214—8.5 A 3 Claims

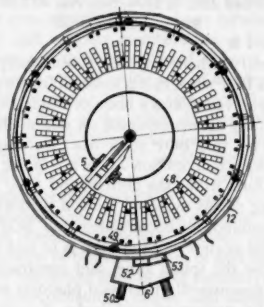


1. An automatic feed apparatus for supply packing spacer sheets one at a time to a packing station, said apparatus including a stack holder that holds a stack of spacer sheets with the end spacer of the stack in a predetermined feed location, a transfer carrier shiftably mounted for movement between a first location adjacent said predetermined location for gripping the end spacer sheet and a second location where it drops the gripped spacer sheet, a chute under the second location to catch the dropped spacer sheet and slide it down forwardly to a pick-up station, and sheet inverting means connected to automatically rotate predetermined spacer sheets about half a revolution around an axis generally perpendicular to these sheets and also flip these sheets over front-to-back so that they reach the pick-up station so inverted.

4,108,322
CIRCULAR MULTISTORY BUILDING WITH A CONVEYOR AND ELEVATOR MOVABLE AROUND THE PERIPHERY

Uwe Kochanneck, 81 Neuer Graben, Dortmund, Fed. Rep. of Germany (46)

Continuation-in-part of Ser. No. 450,712, Apr. 29, 1974, abandoned, and a continuation of Ser. No. 466,762, Jul. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 450,712,. This application Apr. 8, 1976, Ser. No. 675,188
Int. Cl.[2] E04H *6/06*
U.S. Cl. 214—16.1 A 1 Claim



1. A multistory structure comprising:

a car-repair level constituting a story of said structure and including a circularly annular array of car-repair slots occupying substantially all but the center of said car-repair level and between said slots regions adapted to support car-repair workers and tools;

a parts-storage level constituting the story of said structure above said car-repair level and including racks for holding car parts;

conveyor means movable around the periphery of the annular array of said repair level and said parts-storage level for transferring parts therebetween;

a display level constituting a story of said structure and having a peripheral walkway and within said walkway a circularly annular array of display slots occupying substantially all but the center of said display level and each adapted to hold a respective car for show;

an office level above said car-repair, parts-storage, and display levels, constituting a story of said structure, and having offices;

a parking level below said office level, constituting a story of said structure, and including a circularly annular array of parking slots for the storage of cars and occupying substantially all but the center of said parking level;

loading means at said centers for vertically displacing cars in said structure between said slots of said car-repair level, said display level, and said parking level; and

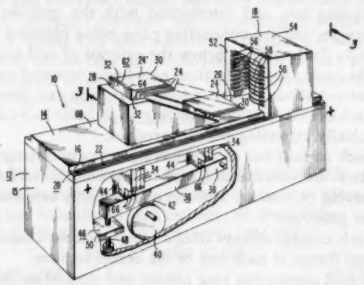
a control center in said structure including control means connected to said loading means and to said conveyor means for operation thereof from said control center.

4,108,323

MACHINE FOR CHANGING THE SPACING OF A PLURALITY OF WAFERS

Robert Charles Shambelan, Bridgewater, and Charles Wesley Lindsley, Cresskill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,419
Int. Cl.[2] B65G *65/04*
U.S. Cl. 214—310 **9 Claims**



1. A machine comprising:

a plurality of wafer receiving surfaces, said wafer receiving surfaces initially having a first spacing associated therewith;

a base having a top surface above which said wafer receiving surfaces extend,

each said wafer receiving surface being at a different height above said top surface than every other wafer receiving surface; and

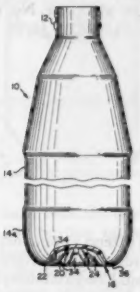
means cooperatively engaged with said surfaces for changing said first spacing to a second spacing.

4,108,324

RIBBED BOTTOM STRUCTURE FOR PLASTIC CONTAINER

Suppayan M. Krishnakumar, Attleboro, Mass.; Siegfried S. Roy, Amherst, N.H.; John F. E. Pocock, Nashua, N.H.; Salil K. Das, Amherst, N.H., and Gautam K. Mahajan, Nashua, N.H., assignors to The Continental Group, Inc., New York, N.Y.

Filed May 23, 1977, Ser. No. 799,635
Int. Cl.[2] B65D *1/02*
U.S. Cl. 215—1 C **5 Claims**



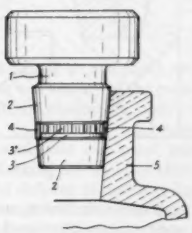
1. A container having a sidewall and a bottom structure closing the container at an end portion of the sidewall, the outer surface of the bottom structure comprising a central concavity, a convex heel surrounding the concavity and merging therewith and with the sidewall end portion, the lowermost points of the heel lying in a common plane, and a plurality of ribs interrupting the outer surface of the concavity and distributed in a symmetrical array, each rib extending longitudinally in the direction of the heel and downwardly from an inner portion of the concavity, whereby the outer end portion of each rib is lower than the inner end portion thereof, characterized by the feature that the ribs are hollow.

4,108,325

DEVICE FOR WATERTIGHT STOPPERING OF BOTTLES

René Emilé Leon Barré, 39, boulevard Bourdon, Paris, France (75004)

Filed Oct. 3, 1977, Ser. No. 838,461
Claims priority, application France, Oct. 5, 1976, 76 29935
Int. Cl.[2] B65D *39/18*
U.S. Cl. 215—364 **5 Claims**



1. A device for watertight stoppering of bottles, comprising:

a stopper stem having at least one circumferential groove with a toothed annular surface portion and an adjacent smooth annular surface portion;

and a ring made of flexible matter, clamped on a portion of its internal surface by the teeth formed into said grooves, said ring having a portion thereof radially adjacent said smooth annular surface portion to maintain a perfectly

smooth and circular external surface on said ring when said device is installed in a bottle,

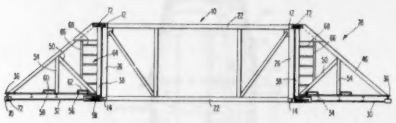
said stem further including at least one tapered annular surface adjacent said groove for contacting the interior surface of the bottle.

4,108,326

ADAPTER FRAMES TO EXTEND LENGTH OF INTERMODAL CONTAINERS

William A. Bertolini, Butler, N.J., assignor to Bertolini Engineering Co., Inc., Butler, N.J.

Filed Jun. 24, 1977, Ser. No. 809,641
Int. Cl.[2] B62D *33/08*
U.S. Cl. 220—1.5 **9 Claims**



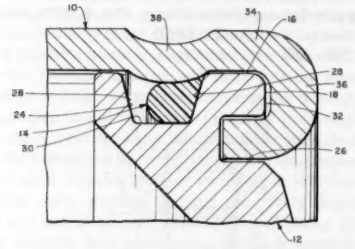
1. A frame adapted to extend a container at one or both of its ends comprised of a substantially right-triangular member including spaced horizontal longitudinally extending members, spaced transverse members connecting them, transversely spaced vertical members secured to said longitudinal members and forming corners therewith, said vertical members including upper ends opposite said corners, diagonal brace members interconnecting said horizontal and vertical members, indexing protuberances extending horizontally from said upper ends of said vertical members, latching means carried by said upper ends of said vertical members and releasable twist lock means carried by said frame at said corners thereof.

4,108,327

WALL-END SECUREMENT FOR PRESSURE RESERVOIRS HAVING AUTOMATIC SAFETY PRESSURE RELIEF

David E. Shonerd, Anaheim, and Carlos Danze, Huntington Beach, both of Calif., assignors to American Safety Equipment Corporation, Encino, Calif.

Filed Nov. 8, 1976, Ser. No. 739,957
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—3 **16 Claims**



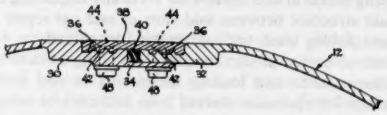
1. In a pressure fluid reservoir having automatic fluid pressure relief above a reservoir predetermined pressure; the combination of: an axially extending tubular wall having an inner end portion terminating outwardly in an outer end portion; a relatively rigid end closure telescoped by said tubular wall end portion, said end closure having an annular recess formed therein opening against said tubular wall inner end portion; a sealing ring in said end closure recess; said wall inner end portion having an annular pressure sealing part formed annularly into said end closure recess against and compressing said sealing ring normally being capable of sealing against fluid flow outwardly around said end closure between said tubular wall and end closure up to said predetermined pressure; positive wall retention means between said wall outer end portion and said end closure for positively securing said wall to said end closure against complete retention separation by forces created by reservoir fluid pressures above said predetermined pressure while being free of fluid pressure sealing between said wall and end closure permitting fluid flow therebetween; said wall and sealing ring being constructed and arranged with selected characteristics such that forces created on said wall by reservoir pressures immediately above said predetermined pressure will deform said wall to move said wall pressure sealing part partially away from said sealing ring to partially release compression therebetween and permit fluid flow between said wall and end closure automatically relieving reservoir pressures rising above said predetermined pressure.

4,108,328

AIRCRAFT FUEL TANK CONSTRUCTION

Darrell Page, Walnut, Calif., assignor to Sargent Fletcher Company, El Monte, Calif.

Filed Nov. 4, 1977, Ser. No. 848,581
Int. Cl.[2] B65D *7/12*
U.S. Cl. 220—5 A **1 Claim**



1. An aircraft fuel tank construction comprising:

a. a cylindrical center section and a conical end section attached to the front and rear ends of the center section;

b. the center section including a pair of opposing recessed flanges with side walls defining a gap throughout the length of the center section, the outer surface of said flanges having grooves parallel to one another and parallel to the side walls of the flanges, a bottom plate attached to the bottom of one of said flanges and extending under said gap and in juxtaposition with the bottom of the other of said flanges, and a flexible center section seal interposed between and in contact with the side walls of the flanges for sealing said gap;

c. a connecting plate connecting said flanges together, said connecting plate having depending parallel tongues extending into and interlocked with the grooves of said flanges, and the connecting plate being clamped substantially flush with or below the exterior of said tank;

d. the center section further including a recessed end flange carried about its circumference at each end thereof, and each of said end flanges having on its outer face circumferentially extending parallel grooves;

e. each conical end section having a recessed flange carried about its open end, and each of said conical section flanges having on its outer face circumferentially extending parallel grooves;

f. each conical section flange lying adjacent center section end flange at each end of the center section;

g. a split connecting ring joining said conical section flange and center section end flange at each end of the center section, said connecting ring having depending parallel tongues extending into and interlocked with the circumferential grooves of said conical section and center section end flanges, and said connecting ring being clamped substantially flush with or below the exterior of said tank;

h. a cylindrical seal retaining ring underlying the joint between each conical end section and the center section, said retaining rings carrying a pair of O-ring seals for sealing each of said joints, a first of said O-ring seals contacting the inner circumference of said center section and sealing thereby one end of the joint and a second of said O-ring

seals contacting the inner circumference of said conical end section and sealing thereby the other end of said joint;

i. interlocking means for interlocking said seal retaining ring against lateral movement with respect to the joint; and

j. said center section seal lying in a direction tangent to and in sliding contact with the outer surface of the first of said O-ring seals at each end of said center section, and said center section seal completely filling and sealing the gap between the recessed end flanges of the center section at the interface of the seals.

4,108,329

FLAT HIGH PRESSURE CONTAINER

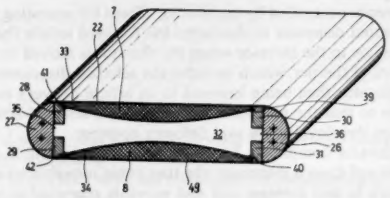
Otto Kabilka, and Thilo Schulz, both of Putzbrunn, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,544

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555727

Int. Cl.[2] B65D *25/18, 7/42*

U.S. Cl. 220—453 **14 Claims**



1. A flat container having narrow sides and wide sides, especially suitable for confining high internal pressures, comprising side frame means rigid against bending and extending along said narrow sides, resin impregnated filament membrane means having longitudinal edges and inwardly facing convex surfaces means securing said longitudinal edges to said side frame means, said membrane means forming internal container walls, supporting external container wall means of resin impregnated filaments substantially surrounding the container and extending substantially coextensive with said membrane means, said supporting external container wall means being secured to said side frame means, and force transmitting means operatively arranged between said supporting external container wall means and said membrane means, whereby the external wall means take up forces resulting from any expansion deformation of said membrane means to minimize deformations of the container.

4,108,330

EASY OPEN CONTAINER END ASSEMBLY

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 8, 1977, Ser. No. 804,581

Int. Cl.[2] B65D *41/02*

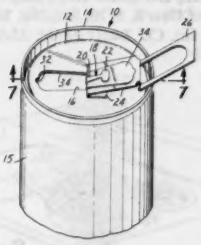
U.S. Cl. 220—260 **14 Claims**

1. A container end assembly comprising:

a container end of flexible sheet material which takes a permanent set when substantially folded, said container end having a generally U-shaped cut defining three sides of an openable aperture in the container end assembly and including a tongue-like portion projecting between the sides and toward the base of the U-shaped cut, said container end having a through opening defined by said U-shaped cut and said tongue-like portion;

a tape adhered to the exterior surface of the container end circumjacent and completely covering said U-shaped cut, the end of said tape adjacent the base of said U-shaped cut being unadhered and having a tab adapted for manual engagement, said tape being peelable from over the U-shaped cut by manually pulling the tab over the tape; and

means for attaching the distal end part of the tongue-like portion to the tape to cause the distal end part to remain attached to the tape and for affording bending of the part of the tongue-like portion between its distal end part and



its proximal end back with the tape during such peeling, the bent tongue-like portion taking a permanent set to hold the peeled tape closely adjacent the container end, and adhesion in shear between the tape and bent tongue-like portion restricting separation of the tape from the container end.

4,108,331

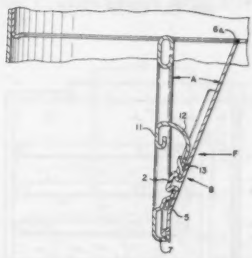
NON-OBSTRUCTING END CLOSURE

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Continuation of Ser. No. 737,928, Nov. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 684,620, May 10, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,562

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—269 **28 Claims**



1. For a container having an end panel, an improved nondetachable self-opening end closure of the push-in type including a tab wherein the tab and closure are pushed into the container to provide, upon opening, an unobstructed passageway through the end panel; said end panel having a score line including portions flanking the tab of an extent greater than the length of the tab and defining an opening flap and also having tab securing means, said pull tab comprising a nose portion, an intermediate portion and a grasping portion, said nose portion having means for pressing said flap inwardly thereby rupturing said score line consequent to a predetermined displacement of said pull tab relative to said end panel, said tab having an integrally formed hingeable rivet panel cooperating with said securing means to attach said tab to said end panel, said intermediate portion including combined displacement-limiting retention and force redirecting means cooperating with one of said flap and said rivet panel during opening of the container to limit the angular displacement of said pull tab relative to said flap and to redirect the opening force and thereby upon up-

ward pull urging the tab with the flap into the container to a non-obstructing position substantially completely beneath said end panel

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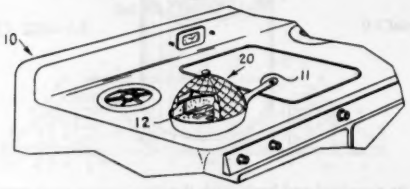
4,108,332

FIRE PROTECTIVE GREASE CATCHER

Anita L. Thompson, 250 Boxer Dr., Reno, Nev. 89512

Filed Dec. 3, 1976, Ser. No. 747,389
Int. Cl.[2] B65D *51/16, 25/00*
U.S. Cl. 220—370 **5 Claims**



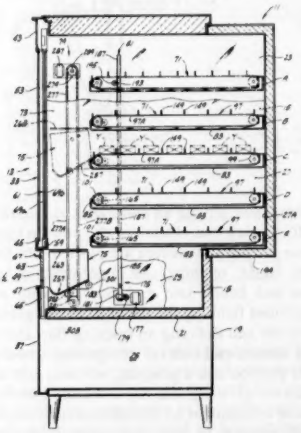
1. A fire protection grease catcher for preventing splatterings from articles being cooked in pans comprising: an arching framework cooperative with a cooking utensil so as to enclose foods being cooked therein; a non metalic fire resistant flexible removable covering upon said framework; means removably securing the base of said cover about said framework; and lifting means from said frame through said cover to lift said framework and covering from their cooperative relationship with the cooking utensil.

4,108,333

ARTICLE VENDOR WITH ELEVATOR

Leonard P. Falk, Florissant; Robert L. Stadler, Overland, and James R. Alford, Florissant, all of Mo., assignors to UMC Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 577,297, May 14, 1975, abandoned. This application Dec. 14, 1976, Ser. No. 750,428
Int. Cl.[2] G07F *11/58*
U.S. Cl. 221—13 **46 Claims**



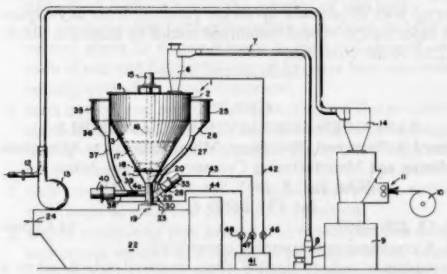
1. An article vendor comprising:
a cabinet having a front, rear and sides with a delivery opening in the front at a delivery level;
a plurality of article dispensers in the cabinet above the delivery level each adapted to hold a row of articles to be vended extending in rear-to-front direction;
the forward ends of the dispensers being spaced rearward from the front of the cabinet so that there is a passage between the front of the cabinet and the forward ends of the dispensers;
each dispenser comprising means for feeding the respective row of articles forward and discharging the forward article off the forward end of the dispenser;
said dispensers being arranged in tiers one above another with the dispensers in each tier located in side-by-side relationship;
the front of the cabinet being windowed for viewing at least the forward articles on the dispensers;
an elevator movable up and down in said passage, said elevator being adapted to occupy a lowered article delivery position at said delivery level for access by a purchaser to an article on the elevator via said delivery opening and being movable to a position at the level of any of said tiers for receiving an article from a dispenser of that tier;
selector means operable by a purchaser for selecting any one of the dispensers for dispensing the forward article therefrom;
means controlled by said selector means for moving the elevator to the level of the tier which includes the selected dispenser;
and means controlled by the selector means for operating the selected dispenser to discharge the forward article therefrom on to the elevator when the elevator is moved to the level of the tier which includes the selected dispenser;
the elevator then being lowered to its article delivery position so that the purchaser may obtain the selected article from the elevator via said delivery opening;
the elevator comprising a tray for receiving the article discharged from a dispenser, the tray being movable up and down in said passage, and also movable rearward in said passage under control of said selector means from a forward position for up and down movement in said passage to a rearward position on reaching the level of the tier including the selected dispenser for receiving the article discharged from the selected dispenser.

4,108,334

APPARATUS FOR FEEDING SCRAP AND BASE PLASTICS MATERIAL TO AN EXTRUDER

Richard W. Moller, Grand Blanc, Mich., assignor to Hydreclaim Corporation, Grand Blanc, Mich.

Filed Dec. 8, 1975, Ser. No. 638,911
Int. Cl.[2] B01F *7/08, 7/24*
U.S. Cl. 222—136 **15 Claims**



1. Apparatus for mixing fluffy scrap and rigid base material and feeding such mixture to an extruder or the like, said apparatus comprising a scrap hopper; an elongate outlet conduit in communication with said hopper for receiving scrap therefrom; means for introducing fluffy scrap to said hopper; scrap feed means extending through said conduit for feeding scrap therethrough; rigid base material supply means; receiver means communicating with said material supply means for receiving therefrom base material and communicating with said outlet conduit between its ends; and base material feed means includ-

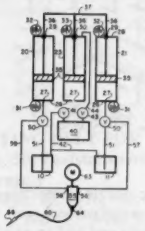
ing a rotary impeller extending through said receiver means for feeding base material from said receiver means into moving scrap in said outlet conduit, whereby said base material may be added to scrap in said outlet conduit, said scrap feed means comprising a shaft rotatable about its longitudinal axis and having an interrupted helical vane thereon.

4,108,335

APPARATUS FOR PROPORTIONING AND MIXING LIQUIDS

Carl Preston Hoff, and Robert Arthur Martin, both of 731 21st St., Bakersfield, Calif. 93301

Filed Sep. 7, 1976, Ser. No. 720,775
Int. Cl.[2] B29B *5/06*
U.S. Cl. 222—137 **3 Claims**



1. An apparatus for proportioning and mixing a plurality of liquids comprising:

(A) a plurality of closed containers each containing a respective said liquid;

(B) a plurality of cylindrical compression chambers individual to said containers having predetermined first and second ends;

(C) conduits interconnecting the containers with the first ends of their respective compression chambers;

(D) pistons mounted in the compression chambers for reciprocal movement in their respective chambers;

(E) means rigidly interconnecting the pistons for corresponding movement in their respective chambers;

(F) a pneumatic ram connected to the interconnecting means adapted when energized to force the pistons toward the first ends of their chambers;

(G) a mixing head having an outlet and inlets individual to the compression chambers;

(H) further conduits interconnecting the first ends of the compression chambers and their respective inlets in the mixing head;

(I) a source of air under pressure;

(J) still further conduits interconnecting the source of air and each of the containers as well as the ram; and

(K) valves in said conduits operable to connect the source of air under pressure to the containers to force their contents into their respective chambers and the pistons therein toward the second ends thereof while retracting the ram, and subsequently to isolate the containers from said source and connect the source to the ram to extend the ram forcing the pistons toward the first ends of their chambers to force the contents of the chambers to the mixing head.

4,108,336

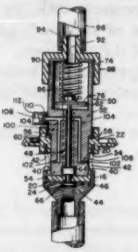
PROBE FOR EXTRACTING TOXIC FLUIDS FROM AN HERMETICALLY SEALED CONTAINER

David L. Anderson, Jr., 23799 Monterey Salinas Hwy. Unit #51, Salinas, Calif. 02889

Filed Jun. 20, 1977, Ser. No. 807,823
Int. Cl.[2] B67D *5/02*
U.S. Cl. 222—148 **2 Claims**

1. A probe adapted to be inserted into a socket valve for an hermetically sealed container characterized by a tubular body adapted to be sealed in a discharge orifice for a container of a body of toxic liquid, a ported closure plate for said tubular body having a first port defined therein, and a ported closure block supported for angular displacement relative to said closure plate disposed in coaxially aligned, contiguous relation with the closure plate having at a second port defined therein registerable with the first port in response to angular displacement imparted to the closure block, comprising:

a cylindrical body adapted to be inserted into the tubular



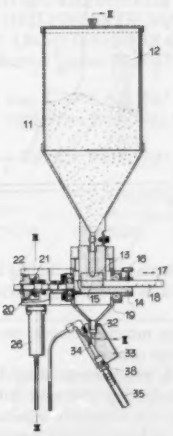
body of said socket valve, means defining a fluid conduit extended through said cylindrical body for conducting a stream of fluid from the container, container vent means including a tubular member defining a passageway extending from said first port to ambient atmosphere, and means for coupling the probe to the socket valve including a key projected from the cylindrical body and adapted to be received by the socket valve in coupling engagement therewith.

4,108,337

QUANTITATIVE SUPPLY APPARATUS OF POWDER COLORING AGENT

Tadashi Iijima, 4-22, Daita 3-chome, Setagaya-ku, Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,581
Claims priority, application Japan, Oct. 27, 1975, 50-128372
Int. Cl.[2] B65D *83/06;* **B67D** *5/54*
U.S. Cl. 222—194 **1 Claim**



1. A quantitative supply apparatus of powder coloring agent comprising:

(A) a container, said container defining a lower end discharge opening;

(B) a rotary shaft having ends, a portion of one end of the shaft being in contact with the lower end discharge opening of said container and said shaft having a measuring

groove defined therein, said groove being adjacent the portion of the shaft which is in contact with the discharge opening of the container;

(C) a regulating rod secured to and extending through the other end of the shaft, and extending into the measuring groove thereof, said rod being adjustably slideable, relative to the axis of the rotary shaft to vary the volume of the groove;

(D) a receiving receptacle defining a lower end discharge opening, said receptacle sealingly contacting both the measuring groove of said shaft and the lower end discharge opening of the container;

(E) an ejector having connection with the discharge opening of said receiving receptacle, said ejector defining an inlet and outlet; and

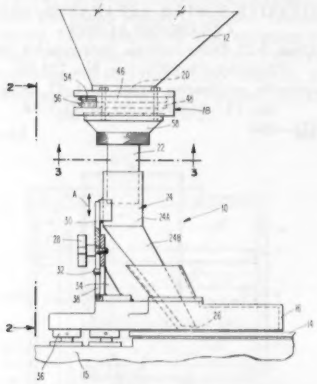
(F) a compressed air conduit connected to the inlet of the ejector and to the outlet thereof.

4,108,338

ROTARY TABLETTING PRESS WITH POWDER FEED ADJUSTMENT VALVE

Paul George Howland, Willow Grove, and John Mergle Alexander, Philadelphia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 15, 1977, Ser. No. 824,762
Int. Cl.[2] B29C *3/00*; B30B *11/08*
U.S. Cl. 222—286 **12 Claims**



1. In a rotary tabletting press including a die table rotatable about an axis, apparatus for feeding tabletting powder to said table, comprising:

a. a storage hopper, mounted on said press, having a bottom powder discharge orifice;

b. a first removable conduit extending downward from said hopper, communicating with said orifice;

c. a second conduit in vertically adjustable telescoping engagement with at least a lower portion of said first conduit, having a discharge end proximate said table for dispensing tabletting powder to said table; and

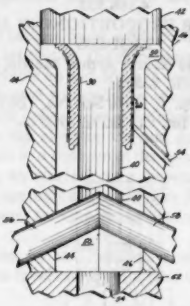
d. a feed frame, connected to said press, surrounding a lower portion of said second conduit including said discharge end thereof, having a lower surface parallel said table for limiting escape of tabletting powder from said table as tabletting powder is dispensed from said second conduit discharge end.

4,108,339

INTEGRAL NOZZLE WITH GAS DELIVERY MANIFOLD

Marvin C. Lunde, St. Joseph, Mich., assignor to Leco Corporation, St. Joseph, Mich.

Filed Dec. 13, 1976, Ser. No. 750,177
Int. Cl.[2] B22D *41/08*
U.S. Cl. 222—591 **9 Claims**



1. An integral ceramic nozzle comprising:

a bore section having a cylindrical wall with an outwardly extending flange at one end and an axially extending cylindrical bore formed therethrough, said bore wall including means for the passage of gas therethrough into said cylindrical bore;

a non gas-permeable ceramic body surrounding said bore section and including a flange at one end surrounding said flange of said bore section and an open opposite end and including a bore extending between said cylindrical bore of said bore section and said open opposite end, said body and bore section defining therebetween a relatively thin elongated hollow annular manifold extending from said flange of said bore section substantially the length of said bore section; and

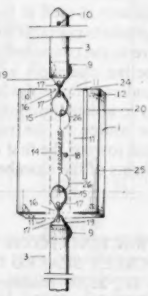
means for supplying an inert gas to said manifold.

4,108,340

WRIST BAND CASE FOR HOUSING A WATCH AND/OR A MINI COMPUTER OR CALCULATOR

John L. Conn, P.O. Box 4501 Station B., Spartanburg, S.C. 29303

Filed Jun. 11, 1975, Ser. No. 586,084
Int. Cl.[2] A44C *5/00*
U.S. Cl. 224—4 E **3 Claims**



1. The combination of a wrist watch and computer composite housing with a wrist band therefore, wherein said housing comprises a pair of similar shaped cases mounted together along abutting rear surfaces, one of said cases having a watch with a visible front face and the other of said cases having a

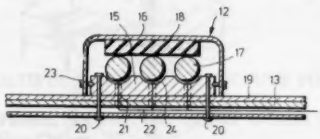
computer with a visible front face wherein said front faces are disposed on opposite sides of the composite housing, a longitudinal slot through the center line of the housing formed by said abutting rear surfaces, a wrist band having a central portion mounted in said slot with the ends of the band extending from opposite ends of the slot, said central portion including an elastic section and connecting means swivelly securing the extending end portions of the band to the central portion, wherein said end connecting means are extendible outward of said slot and the central portion of said band is longitudinally slidable in said slot whereby the elastic section permits the composite case to be pulled away from the wrist and the swivel means permits the case to be rotated for exposure of either of the opposite sides.

4,108,341

CARRYING BELT FOR BATTERIES

Siegfried Pettinger, 50, Leutstettenerstrasse 50, 813 Starnberg, Fed. Rep. of Germany

Filed Jan. 28, 1976, Ser. No. 652,975
Int. Cl.[2] A45F 5/00
U.S. Cl. 224—5 H **2 Claims**



1. A carrier belt made of synthetic plastic material and having a predetermined width, adapted for use with an electrical battery or the like, the belt being usable as a portable current source and having external and internal sides, a buckle, a tongue and at least one compartment on the outside thereof for receiving at least the one electrical battery or the like, the compartment having a width smaller than said predetermined width, the compartment comprising:

a carrier plate formed with at least one recess for receiving the electrical battery or the like, said carrier plate being attached to the belt;

a protective cap attached to said carrier plate;

a pillow of foamed plastic synthetic material disposed between the electrical battery or the like and said protective cap for pressing the electrical battery or the like against said carrier plate and for retaining the electrical battery or the like in said recess;

a protective cover of synthetic and flexible plastic material surrounding the belt, said cover being internal and external sides, the compartment being attached to the external side of said protective cover;

fastening means for attaching said protective cover to said carrier plate;

lead means attachable to the electrical battery or the like, and wherein said carrier plate, said protective cover, and the belt are formed with a first set of openings, respectively, for passage of said lead means to the internal side of the belt, and wherein said protective cover and the belt are formed with a second set of openings, respectively, said carrier plate and said protective cap being made of a material relatively stiff with respect to the belt; and

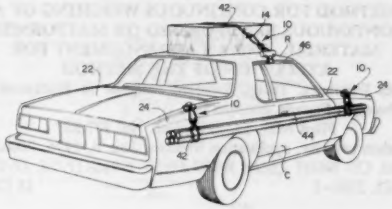
rivet means passing through said second set of openings for attaching said carrier plate to the belt.

4,108,342

CARRIER ATTACHMENT FOR AUTOMOBILES

Ralph D. Riva, 77 Bellman Ave., Warwick, R.I. 02889

Filed Oct. 3, 1977, Ser. No. 839,101
Int. Cl.[2] B60R 7/00
U.S. Cl. 224—42.01 **6 Claims**



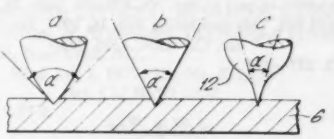
1. A device adapted for use in connection with vehicles and the like having hood and trunk enclosures to form a tie down for the support of cargo comprising, a line having a loop portion at one end thereof and an enlarged retaining plug secured thereto at the other end thereof, said retaining plug of a dimension substantially greater than the width of the peripheral spaces between said hood and trunk enclosures and adjacent fenders and adapted for positioning interiorly of said hood or trunk compartment, said line of a dimension less than the width of said spaces so as to project therethrough and outwardly therefrom so that said loop portion extends at least partially outward from said enclosures, and temporary positioning means mounted on said line intermediate the ends thereof and adapted to be positioned outwardly of said compartments, said temporary positioning means adapted to position said device with respect to said fenders prior to closing said hood or trunk enclosures, said temporary positioning means comprising a suction cup having an upwardly projecting shank through which said line extends, said loop portion extending outwardly from said shank.

4,108,343

METHOD OF AND APPARATUS FOR BREAKING AWAY OF PREPUNCHED PIECES OF MATERIAL FROM CURVED OR ARCHED SHEETS OF MATERIAL

Franz Vossen, Boisheimer Strasse 58, 4057 Bruggen 1, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,464
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1975, 2535452
Int. Cl.[2] B26F 3/00
U.S. Cl. 225—1 **27 Claims**



1. A method of breaking pre-punched pieces of material away from flexible sheets of material, comprising the steps of applying the sheet of material to a break-away block, engaging the pieces of material to be broken away, on one side by a pointed component which penetrates into the surface of the piece of material to be broken away only to such an extent as to prevent lateral displacement of the spike in relation to the surface, and on the other side by a counter-pressure mounting support which supports substantially oppositely-disposed portions of the edge of the piece of material to be broken away, moving the pointed component further in the direction of the counter-pressure mounting support whereby the piece of mate-

rial bows under load to such an extent that it loses its hold on said oppositely disposed edge portions, and pushing the piece of material in the bowed condition through the counter-pressure mounting support whereby it is released from the pointed component after leaving said mounting support.

4,108,344

METHOD FOR CONTINUOUS WEIGHING OF A CONTINUOUS BANDFORMED OR MATFORMED MATERIAL, AND AN ARRANGEMENT FOR EXECUTION OF THE METHOD

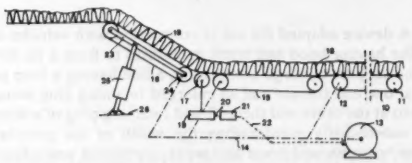
Stellan Dahlberg, Tidan, Sweden, assignor to Rockwool Aktiebolaget, Skovde, Sweden

Filed Mar. 15, 1977, Ser. No. 777,857

Claims priority, application Sweden, Jun. 6, 1976, 76063817

Int. Cl.[2] B65H *23/22;* **B65G** *69/00;* **G01G** *11/14, 13/04*

U.S. Cl. 226—1 **13 Claims**



1. A method for continuous weighing and surface weight control of a comprehensive material in continuous travelling band or mat form, comprising supporting and transporting the material along a first driven conveyor and onto a second driven conveyor spaced a short distance from the discharge end of the first conveyor, the first and second conveyors being oriented to form an upwardly concave obtuse angle such that the band of material deforms and bends through an upwardly concave obtuse angle as it passes from the first conveyor to the second conveyor, continuously weighing the band of material as it passes between said first and second conveyors by passing the deformed and bent band onto and along a third non-driven idler conveyor means located between said first and second conveyors and arranged to continuously sense the weight of the band passing therealong, and varying the speed of said first and second conveyors in response to weight changes sensed by said third conveyor means, but maintaining the speeds of said first and second conveyors equal.

4,108,345

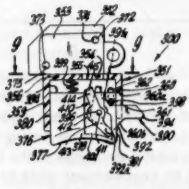
ELECTROMAGNETIC STAPLER AND SAFETY TRIGGER THEREFOR

George Frank Manganaro, 141 Malcolm Ave., Garfield, N.J. 07026

Continuation-in-part of Ser. No. 670,649, Mar. 26, 1976, Pat. No. 4,033,500. This application Jun. 16, 1977, Ser. No. 807,020

Int. Cl.[2] B25C *1/06, 5/10*

U.S. Cl. 227—131 **12 Claims**



1. A trigger for a staple driving tool, said trigger comprising a housing, a member slidably mounted in said housing and being depressable relative to said housing, first means caused by said depressable member to transmit the depressing motion to actuate a switch for completing a repetitive action staple driving circuit, driving action selection means operably mounted with said first means and selectively movable between two positions so that in a first position, said first means being disengaged from said switch by the staple driving action of the tool while said member is depressed, whereby the staple driving will not repeat until said member is again depressed, and in a second position said driving action selection means contacts said switch to actuate said repetitive action driving circuit and remains in contact during said action while said member is depressed, whereby the staple driving circuit action will repeat until said member is released.

4,108,346

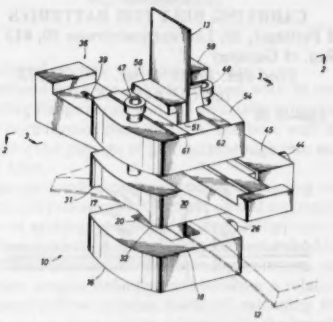
ALIGNMENT CLAMP

James Warren Minix, deceased, late of Houston, Tex.; by Richard W. Minix, administrator, 6710 Biggs, Houston, Tex. 77017, and by Helen Minix, administratrix, 14214 Lantern La., Houston, Tex. 77015

Filed Mar. 15, 1976, Ser. No. 666,798

Int. Cl.[2] B23K *37/04*

U.S. Cl. 228—49 **6 Claims**



1. An alignment clamp for use in positioning first and second adjacent plates along a common parallel position and spaced from one another which apparatus comprises:

an elongate strap having upper and lower ends and adapted to extend between a first and second plate to be positioned adjacent to one another;

a generally planar plate means adapted to engage a surface of said first and second plates to be aligned and having an opening therethrough adapted to receive the lower end of said strap and which opening has a pair of tapered opposing sides with a wedge shaped strap gripping means therein;

generally parallel upper and lower planar plates means having slots therethrough for receiving said strap and facing angled surfaces adjacent said slots; said angled surfaces being adapted to receive a wedged shaped body for separating said planar plates; the lower planar plate having a surface adapted for engaging the upper surface of the first and second plates to be aligned and the upper planar plate having a gripping means for securing said strap and fixedly positioning said upper planar plate with respect to said strap.

4,108,347

ONE PIECE FOAM CUP

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

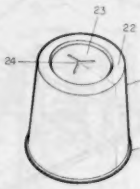
Filed Feb. 23, 1977, Ser. No. 771,150

Int. Cl.[2] B65D *21/02, 3/10*

U.S. Cl. 229—1.5 B **4 Claims**

1. A one-piece container manufactured from plastic foam sheet material, said container having a sidewall terminating at

the top with a beaded rim and at the lower end with a closed bottom, said sidewall having at least one overlapped seam running from the rim to the bottom, said sidewall having a uniform thickness from top to bottom yet varying in density from a minimum at the top to a maximum at the bottom, said bottom constructed of two areas, the first area in the form of a



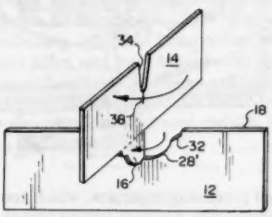
concentric ring attached at its outermost extent to the bottom of the sidewall and the second area spanning the central region of the bottom of the cup and attached to said first area, said second area being nearer the top of the container than said first area, said second area containing a centrally positioned bottom closing seam that protrudes downwardly from said second area.

4,108,348

MULTIPLE PARTITION STRUCTURE FOR PAPERBOARD CONTAINER

James H. Partain, Norcross, Ga., assignor to Stone Container Corporation, Chicago, Ill.

Filed Sep. 14, 1977, Ser. No. 833,027
Int. Cl.² B65D *5/48, 25/04*
U.S. Cl. 229—15 **23 Claims**



1. In a container formed from a one-piece blank having at least two side walls, a first end wall having a first width and extending between said two side walls and a bottom wall connected together, a first portion of a second end wall hingedly connected along a side free edge of one of said side walls, and a second portion of said second end wall hingedly connected along a side free edge of the second one of said side walls, said first and second portions of said second end wall secured together such that said second end wall width is substantially equal to said first end wall width, the improvement comprising:

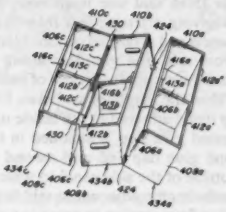
partition means including a first partition panel hingedly secured to one of said portions of said second end wall and extending between said two end walls, a second partition panel secured to a first edge of said first partition panel by folding means integral with said first and second partition panels for folding said second partition panel into engagement with said first partition panel between said side walls substantially perpendicular to said first partition panel.

4,108,349

SPACE DIVIDER FOR CARTONS AND THE LIKE

James L. Pfaffendorf, Maple Grove, Minn., assignor to Boise Cascade Corporation, Boise, Id.

Filed Nov. 15, 1977, Ser. No. 851,719
Int. Cl.² B65D *5/48*
U.S. Cl. 229—15 **10 Claims**



1. A space divider for cartons and the like, comprising

(a) a rectangular planar blank of sheet material including vertical parallel spaced first score lines defining a front panel, first and second side panels, a pair of rear panel sections connected with the free ends of the first and second side panels, respectively, and a divider panel connected with the free end of one of said rear panel sections, the length of said divider panel being generally equal to the length of said side panels;

(b) one of said panels containing means defining a horizontal first line of fold, the remaining panels each containing throughout substantially the length thereof a linear first cut extending colinearly with respect to said first line of fold, whereby said panels are each divided into a lower first section and an upper second section;

(c) said front panel, first and second side panels, and rear panel sections being foldable about said first score line to define a tube of rectangular crosssectional configuration, said divider panel being foldable transversely across the tube to a position parallel with the side panels;

(d) means for connecting the adjacent free ends of said rear panel sections, whereby said first and second panel sections define in the tube first and second cell units, respectively, said divider panel dividing each cell unit into a pair of cells;

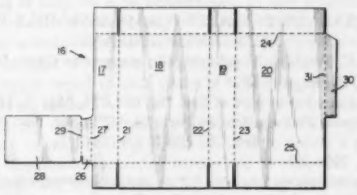
(e) said second cell unit being foldable about said first line of fold to a position in which the external surfaces of the first and second panel sections joined by said first line of fold are in contiguous engagement, thereby to define an open-ended multi-cell space divider the outer periphery of which has a rectangular crosssection.

4,108,350

CARTON WITH INTEGRAL REMOVABLE CARD

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,156
Int. Cl.² B65D *5/00*
U.S. Cl. 229—37 R **1 Claim**



1. In combination, a carton and integral coupon card constructed from a one piece cut and scored blank of paperboard or the like comprising, a plurality of main body side panels

foldably attached to one another along parallel score lines, end closure flaps foldably attached to the upper and lower ends of said main body side panels and a first glue flap of a length less than the length of said main body side panels foldably attached to an end of one main body side panel, the improvement comprising, a second glue flap and integrally attached coupon card foldably attached to the opposite end of another main body side panel remote from said one main body side panel, said second glue flap having a length less than the length of said main body side panels and arranged on said blank to be longitudinally spaced from said first glue flap along the main body side panel such that the combined length of both said glue flaps is slightly longer than the length of said main body side panels, said first glue flap being adhered to the inside of said side panel to which said second glue flap is attached in the region adjacent to said second glue flap and said second glue flap being adhered to the outside of the side panel to which said first glue flap is attached in the region adjacent to said first glue flap, said arrangement of glue flaps serving to provide a slight overlap of the two glue flaps to form a completely glued joint along the entire length of the carton while placing the first glue flap interiorly of said carton and the second glue flap and attached coupon card exteriorly of said carton, said coupon card being releasibly adhered to the exterior of the body side panel to which the first glue flap is attached and removably attached to said second glue flap along a perforated score line.

4,108,351

ADHERING METHOD

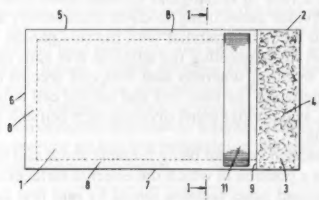
Edmund Alan Hough, Wavre, Belgium, assignor to Imperial Chemical Industries Limited, London, England

Filed May 3, 1976, Ser. No. 682,790

Claims priority, application United Kingdom, May 8, 1975, 19380/75

Int. Cl.[2] B65D *33/20*

U.S. Cl. 229—62 **4 Claims**



1. An envelope of the self-seal type comprising first and second overlying sheets of flexible material, the opposed surfaces of said sheets having bonded thereto a thermoplastic pile so that the internal surfaces of the envelope are pile surfaced, the other surfaces of said sheets being free of pile, said first sheet being of greater length than said second sheet so as to form a closure flap which can be folded into engagement with a cooperating portion of said other surface of said second sheet, and a layer tack adhesive on said cooperating portion.

4,108,352

CONTINUOUS BUSINESS FORMS ASSEMBLY WITH ANTI-TENTING MEANS

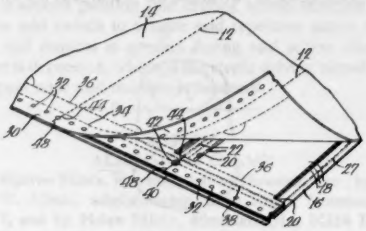
Gordon C. Peschke, Mundelein, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Continuation-in-part of Ser. No. 684,277, May 7, 1976, abandoned. This application Nov. 24, 1976, Ser. No. 744,623

Int. Cl.[2] B65D *27/10*

U.S. Cl. 229—69 **11 Claims**

1. A continuous business forms assembly comprising a zigzag folded stack of a multiplicity of superimposed, elongated plies of paper, including upper and lower plies and a plurality of intermediate plies, each of said plies being provided with a longitudinally extending, control punch margin, said plies being held in assembled relation by longitudinally extending glue lines between adjacent plies adjacent said control punch margins, individual form lengths in the assembly being delimited by cross lines of weakening in the plies, all of the intermediate plies having notches and being completely severed across



their widths at at least some of said cross lines of weakening, said upper and lower plies being at least partially unsevered about said notches and severed between said notches, so that stresses caused by folding said assemblies into said track are relieved to prevent tenting.

4,108,353

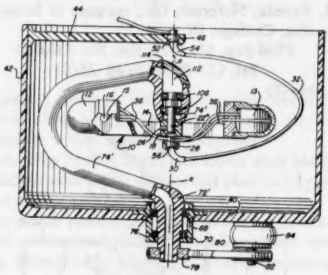
CENTRIFUGAL APPARATUS WITH OPPOSITELY POSITIONED ROTATIONAL SUPPORT MEANS

Richard I. Brown, Northbrook, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 31, 1977, Ser. No. 829,291

Int. Cl.[2] B04B *9/08*

U.S. Cl. 233—26 **19 Claims**



1. Centrifugal processing apparatus, which comprises:

a stationary base;

a processing chamber rotatably mounted with respect to said base for rotation about a predetermined axis;

a flexible umbilical cable segment for establishing communication with said processing chamber, one end of said cable segment being fixed with respect to said base substantially along said axis at one side of the processing chamber, said cable segment extending around said processing chamber with the other end of the cable segment being attached substantially on said axis in rotationally locked engagement to the processing chamber;

a one ω turn arm coupled to one side of the processing chamber, around the processing chamber and to a spaced location at the other side of the processing chamber;

first rotatable support means coupling said one ω turn arm to said processing chamber at said one side thereof;

second rotatable support means coupling said one ω turn arm to said stationary base at the other side of the processing chamber; and

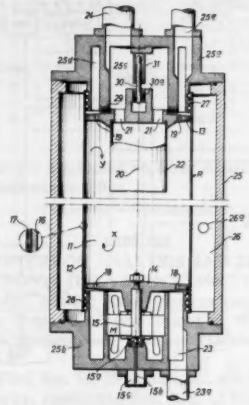
means for rotating said turn arm at one ω about said predetermined axis.

4,108,354

GASEOUS MIXTURE ULTRACENTRIFUGE

Kristian Dahl Madsen, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Continuation-in-part of Ser. No. 594,738, Jul. 10, 1975, abandoned. This application Apr. 15, 1976, Ser. No. 677,062
Claims priority, application Sweden, Jul. 23, 1974, 7409554
Int. Cl.[2] B04B *11/06*
U.S. Cl. 233—30 5 Claims



1. A gaseous mixture ultracentrifuge comprising a rotatively mounted rotor formed by a hollow cylindrical wall having opposite ends provided with end covers, said rotor having an axis about which the rotor rotates, each of said covers having a plurality of outlet holes formed therethrough and radially spaced from said axis, one of said covers having at least one inlet hole formed therethrough and which is radially spaced from said axis but more adjacent to said axis than are said outlet holes, said rotor having an inside free from non-rotative parts and said covers completely enclosing said inside excepting for said holes, means for rotating said rotor, feeding means for feeding a gaseous mixture to said inlet hole, and collecting means for collecting separated components of the mixture from said outlet holes, said rotor having solid shafts extending on said axis away from said end covers and bearings in which said shafts are rotatively mounted, said feeding and collecting means being non-rotative and spaced radially from said axis and free from said shafts.

4,108,355

ROTARY INDICATING DEVICE PROVIDED WITH A PLURALITY OF INDICATING PLATES

Jusuke Yaguinuma, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Oct. 5, 1976, Ser. No. 729,868
Claims priority, application Japan, Oct. 6, 1975, 50-136445[U]
Int. Cl.[2] G09F *11/06;* G04B *19/02*
U.S. Cl. 235—1 C 1 Claim

1. A rotary indicating device comprising:

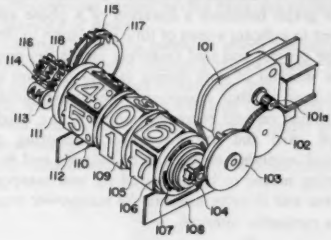
a rotatable drum member having a pair of flange portions opposed to each other;

means defining a plurality of holes in each of said flange portions;

a plurality of indicating plates having a corresponding plurality of projecting portions each of rectangular cross-section and inserted respectively in said holes to make said drum rotatably support said indicating plates;

a turning member having at least one projecting bank portion engageable with said indicating plates to turn them; and

a ring-shaped spring fitted to one of said flange portions and resiliently pressing one of said projecting portions of each



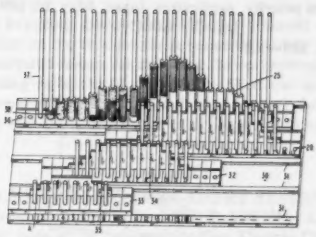
of said indicating plates along the diametral direction of said drum.

4,108,356

SCHEDULING TOOL

Robert W. Bengtson, Succasunna, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Division of Ser. No. 562,606, Mar. 27, 1975, Pat. No. 4,006,345.
This application Oct. 26, 1976, Ser. No. 741,930
Int. Cl.[2] G06C *27/00;* G09F *3/18;* G09B *19/18;* G09F *5/00*
U.S. Cl. 235—69 8 Claims



1. A scheduling tool for establishing an allocation of manpower during a project in which there is a plurality of phases comprising:

a plurality of scheduling elements;

a plurality of receiving means on each scheduling element, each pair of adjacent receiving means being spaced apart the same distance;

a plurality of manpower measuring means, each being adapted to be mounted on one of said receiving means so that it projects in a direction perpendicular to said scheduling element, said manpower measuring means being adapted to be positioned end to end so that several manpower measuring means are mounted on each of said scheduling elements by several of said receiving means;

a plurality of graph cards, each indicating the manpower requirements against time as a product of persons used and unit of time for a particular phase of said project;

said graph cards being adapted to be mounted each on one of said scheduling elements so that the representation of time is in intervals, each of which is represented linearly a distance equal to said distance between each of said receiving means;

indicating means including a plurality of locating means, each of said locating means adapted to secure a plurality of manpower measuring means end to end; and

a manpower level marker for measuring the length of a number of manpower measuring means positioned end to end and indicating the total as a product of the persons employed and units of time of the manpower represented by said number of manpower measuring means;

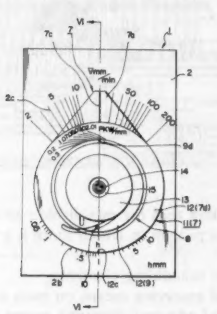
whereby when each one of said plurality of graph cards indicating manpower requirements for a particular phase is mounted on one of said scheduling elements and the plurality of scheduling elements are then aligned so that each graph indicates a duration of a phase and is positioned to indicate a span of time in relation to the duration of the project and said receiving means, representing the same interval of time during said project are in straight alignment so that manpower measuring means can be positioned on said receiving means to the height of said graph card and the manpower measuring means on aligned receiving means can be secured end to end on a locating means to be measured by said manpower level marker and thereby indicate the manpower requirements for a particular interval.

4,108,357

FEED-RATE INDICATOR FOR ELECTROCHEMICAL GRINDING

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japan Research Incorporated, Kanagawaken, Japan

Filed May 24, 1977, Ser. No. 799,971
Claims priority, application Japan, May 26, 1976, 51-59972
Int. Cl.[2] G06C *27/00, 3/00;*
U.S. Cl. 235—119 **4 Claims**



1. A device for automatically calculating the feed rate of a workpiece relative to an electrochemical grinding wheel in an electrochemical grinding operation comprising:

a base plate provided with indicia of the feed rate V along one portion of a circle having a center and indicia of the cutting depth *h* along another portion of a circle having the same center as the first circle;

a rotatable first member mounted on said plate and rotatable about said center, said first member carrying an index cooperating with said indicia of feed rate V and being provided with indicia of the drive force p per unit width of the cutting area;

a second member rotatable about said center and provided with an index cooperating with said cutting depth indicia h;

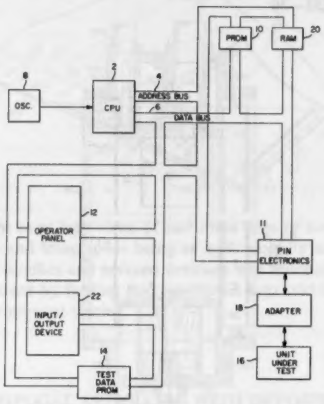
a third member displaceable on said base and provided with an index cooperating with the indicia *p* of said drive force; and mechanical means connecting said members for mutual and relative movement whereby said indexes cooperate with the respective indicia V, *p* and *h* in accordance with the relationship $V = Ap/h + B/\sqrt{h}$, where A and B are constants.

4,108,358

PORTABLE CIRCUIT TESTER

Casimer Niemaszyk, Roselle Park, N.J., and Peter Rothenberg, West Hills, Calif., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 22, 1977, Ser. No. 779,978
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—302 **7 Claims**



1. A system for testing electrical units, comprising:

programmable memory means for storing a test program relating to a particular unit to be tested;

executive memory means for storing an executive test program;

a central processing unit connected to the programmable memory means for reading the test program stored therein, and connected to the executive memory means for executing the executive test program in accordance with the read test program;

means connected to the central processing unit, the executive memory means and the unit to be tested, and controlled by the central processing unit for applying the executed executive test program to the unit to be tested; and

indicating means connected to the programmable memory means, the executive memory means, the central processing unit and the means for applying the executed executive test program to the unit to be tested, and operable by all of said means for indicating test operating instructions and unit test status.

4,108,359

APPARATUS FOR VERIFYING THE EXECUTION OF A SEQUENCE OF CODED INSTRUCTIONS

Richard C. Proto, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 30, 1977, Ser. No. 782,692
Int. Cl.[2] G06F *11/08*
U.S. Cl. 235—304 **9 Claims**

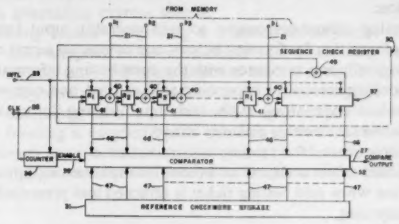
1. An apparatus for verifying the execution of an input sequence of coded instruction in the form of *i*-bit binary words, where *i* is the number of bits in each binary word, comprising:

a sequence check register including an *n*-stage feedback shift register for generating a binary sequence, where the number of stages, *n*, of said feedback shift register is greater than $i + 1$, and means for combining the input sequence of binary words with said binary sequence to compute an *n*-bit sequence checkword;

means for storing a predetermined *n*-bit reference sequence checkword; and

means connected to said sequence check register and said

storage means for comparing bit-by-bit said computed sequence checkword with said stored reference check-



word and for producing an error signal when the compared checkwords differ.

4,108,360

METHOD OF ERROR ANALYSIS AND DIAGNOSIS IN ELECTRONIC DATA PROCESSING SYSTEMS

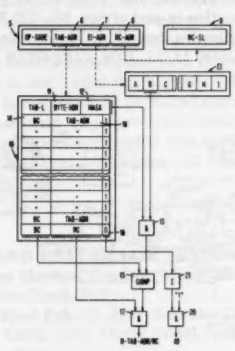
Walter Beismann, Altdorf; Hans Hermann Lampe, Herrenberg, and Werner Pohle, Grafenau, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,085

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2654389

Int. Cl.[2] G06F *11/00*

U.S. Cl. 235—304 **8 Claims**



1. A method for error analysis and diagnosis in electronic data processing systems wherein the system includes in storage a plurality of predefined error images, said method comprising:

extracting significant error information from a first error image by analyzing the error bytes of said error image;

extracting significant error information from at least a second error image by analyzing the error bytes of said second error image;

combining the significant error information from the error bytes of said error images to generate therefrom the address of a predetermined error file; and

addressing said error file to identify the kind of error and its location.

4,108,361

UNIVERSAL MARK SENSE BETTING TERMINAL SYSTEM AND METHOD

Stephen R. Krause, 3607 Anton Farms Rd., Baltimore, Md. 21208

Filed Oct. 12, 1976, Ser. No. 729,807

Int. Cl.[2] G06K *7/00, 3/00*

U.S. Cl. 235—375 **13 Claims**

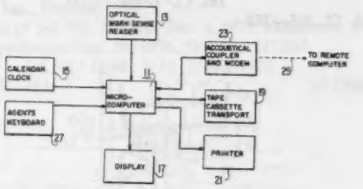
1. Apparatus for accepting, validating and recording betting information on slips filled out by the bettor for any one of a plurality of games, comprising in combination:

(a) a micro-computer means having program storage means for a plurality of games,

(b) said betting slip having means to select one only of said plurality of games and initiating the program of the selected games in said micro-computer means,

(c) optical reader means for transferring the betting information from said slips into memory storage under control of the micro-computer means,

(d) printer means under control of said micro-computer means,



(e) calendar clock means for supplying time information of each bet,

(f) tape cassette transport means for recording slip and time information,

(g) display means,

(h) agents keyboard means for initiating printout of the information on the tape means in selective manner via the micro-computer means for checking the correctness of the slip, causing rejection of improperly filled out slip, displaying reason for rejection, dislaying amount due from customer and for accepting or rejecting the betting slip.

4,108,362

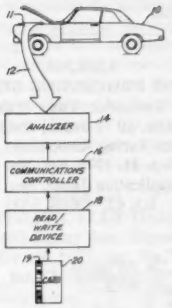
VEHICLE DIAGNOSIS DATA ENTRY SYSTEM

Gerald C. Trussell, Park Ridge, and Robert W. Arnston, Schaumburg, both of Ill., assignors to Sun Electric Corporation, Chicago, Ill.

Filed Jan. 28, 1977, Ser. No. 763,338

Int. Cl.[2] G01L *3/26;* **G01R** *13/42;* **G06K** *7/00*

U.S. Cl. 235—375 **7 Claims**



1. In an analyzer controlled by a digital processor having a memory for analyzing a vehicular engine, improved apparatus for reading data into the analyzer comprising:

a sheet bearing specifications of the engine printed in alphanumeric form and bearing a machine-readable digital code representing at least a portion of the specifications;

coding means for reading said digital code on the sheet and for converting the digital code into electronic digital signals; and

communication means for transmitting the digital signals to

the engine analyzer in a form usable by the engine analyzer, whereby the specifications can be read into the memory of the analyzer.

4,108,363

RECORD CONTROLLED MECHANICAL STORE

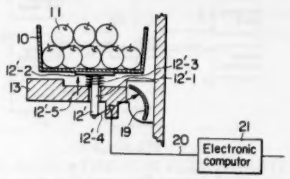
Iida Susumu, 1246, Sengokuhara, Hakone-cho, Ashigarashimogun, Kanawaga-ken, Japan

Filed Jun. 25, 1976, Ser. No. 699,974

Claims priority, application Japan, Jun. 25, 1975, 50-77535; Sep. 8, 1975, 50-108067; Oct. 23, 1975, 50-126900; Oct. 4, 1975, 50-119380; Oct. 28, 1975, 50-128909; Dec. 30, 1975, 50-158712

Int. Cl.[2] G06K *15/00*

U.S. Cl. 235—383 **32 Claims**



1. A vending machine, comprising:

a casing; a weighing scale means having at least one retaining vessel for retaining like commodities therein within said casing and a weighing circuit, said weighing scale means weighing said retaining vessel and the retained commodities, and said weighing circuit producing an electric signal correlated to the weight of said weighing vessel and the retained commodities;

access means having a lock that is normally locked to prevent access through said casing, and that can be released providing access through said casing to said commodities;

converting means including a computing circuit for comparing the weights of said retaining vessel and retained commodities before and after the removal of commodities from said retaining vessel, and producing an electrical signal output corresponding to a numerical value of the quantity of commodities removed; and

means for admitting a lock-releasing medium to release the lock of said access means to permit removal of commodities only upon the admission of said medium and prevent the removal of commodities in the absence of said lock-releasing medium.

4,108,364

APPARATUS FOR PROCESSING BETTING TICKETS

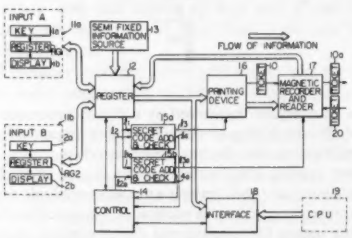
Takehiko Tanaka, Kawasaki; Yuzo Wakatsuki, Tokyo, and Toshio Niiya, Fuchu, all of Japan, assignors to Fujitsu Limited and The Japan Racing Association, both of, Japan

Filed Sep. 21, 1976, Ser. No. 725,181

Claims priority, application Japan, Sep. 23, 1975, 50-115271

Int. Cl.[2] G06K *5/00*

U.S. Cl. 235—419 **7 Claims**



1. An apparatus for processing operator input betting information to issue a betting ticket, and for determining whether said betting ticket is authentic once a betting ticket is returned and presented for payment, said apparatus comprising, in combination:

forming means responsive to said operator input betting information for forming at least one computed secret code logically in accordance with the input betting information,

recording means for recording said at least one computed secret code along with said input betting information when said betting ticket is issued,

reading means for reading said recorded at least one computed secret code and said recorded input betting information when said betting ticket is returned and presented for payment,

said forming means being additionally responsive to said recorded input betting information read by said reading means for forming at least one additional secret code logically in the same manner as said at least one computed secret code was formed, and

comparing means for comparing said at least one computed secret code read by said reading means with corresponding said at least one additional secret code formed by said forming means in order to determine coincidence therebetween, whereby to validate the betting ticket returned and presented for payment.

4,108,365

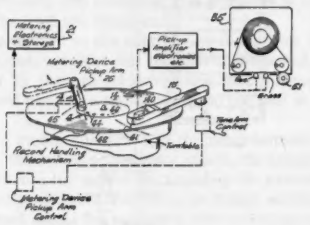
COIN-OPERATED RECORDING MACHINE

Robert M. Hughes, 10009 Banyan, Alta Loma, Calif. 91701

Division of Ser. No. 119,535, Mar. 1, 1971, Pat. No. 3,990,710, which is a continuation-in-part of Ser. No. 739,325, Jun. 24, 1968. This application Jan. 15, 1976, Ser. No. 649,410

Int. Cl.[2] G06K *15/02, 7/08, 7/10;* **G11B** *5/86*

U.S. Cl. 235—419 **3 Claims**



1. In a recording apparatus:

records adapted to be selectively reproduced in said apparatus for producing corresponding recordings,

said records having digital signal-identifying indicia thereon,

an automatic record-keeping apparatus for sensing said digital signal indicia on each record being reproduced to identify the recording being made, and

an indicating apparatus coupled with said record-keeping apparatus including means to print a record of the recordings made.

4,108,366

APPARATUS FOR PROVIDING AND SENSING CODED INFORMATION

Leonard J. Genest, Huntington Beach, and Frederick E. Feagin, Tustin, both of Calif., assignors to Monitron Industries, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 430,247, Jan. 2, 1974, Pat. No. 3,926,021, and a continuation of Ser. No. 631,558, Nov. 13, 1975. This application Nov. 8, 1976, Ser. No. 739,881

Int. Cl.[2] G06K *7/08, 19/06;* **G11C** *5/02*

U.S. Cl. 235—450 **10 Claims**

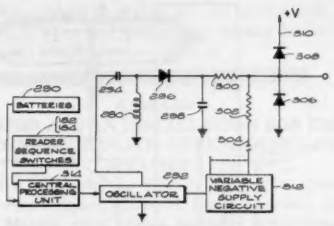
1. A system for sensing coded information carried by a card,

said coded information being provided by the relative presence and absence of magnetically reactive material at adjacent limited areas of the card, comprising:

means adapted to receive said card;

an alternating current source;

sensing means comprising a plurality of adjacent sensing coils adapted to be coupled to said alternating current source, each coil being disposed around a respective ferromagnetic core, a respective annular ferromagnetic sleeve encircling each said coil and a ferromagnetic member forming a magnetic path between each core and sleeve, each said sleeve having a cross-sectional configuration in a plane substantially parallel to the plane of the card about



the same as the configuration of respective limited areas, said each sleeve containing the magnetic field produced by the coil substantially within the projected wall of said sleeve; and,

means for aligning said respective limited areas with and in close proximity to said sleeves,

whereby the relative presence of relatively magnetically reactive material positioned in a respective limited area adjacent to and within the magnetic field of a sensing coil causes a first signal to be produced across said coil and the relative absence of magnetically reactive material positioned in a respective limited area adjacent to and within the magnetic field of a sensing coil causes a second signal to be produced.

4,108,367

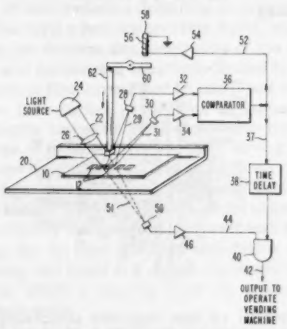
TOKEN AND READER FOR VENDING MACHINES

William James Hannan, Concord, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,103

Int. Cl.[2] G06K *7/10, 19/06;* **G03H** *1/26;* **G11C** *13/04*

U.S. Cl. 235—457 **4 Claims**



1. A token reader, comprising

means producing a holographic readout beam,

means to guide a token containing a plurality of pairs of holograms into the path of said readout beam,

two photodetectors positioned at predetermined spaced locations to receive respective first order beams from the holograms of an illuminated pair of holograms,

an electrically-operated means for obliterating a pair of holograms on said token which are positioned in the path of said readout beam, and

comparator means operative upon the occurrence of equality of electrical outputs of said two photodetectors to actuate said means for obliterating holograms.

4,108,368

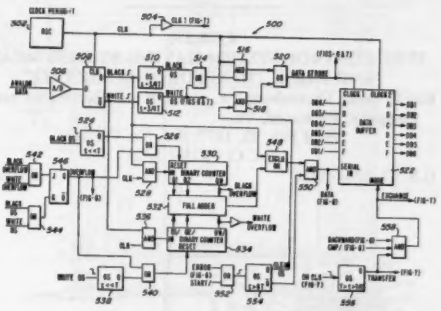
CODED RECORD AND METHOD OF AND SYSTEM FOR INTERPRETING THE RECORD

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 104,955, Jan. 8, 1971, abandoned. This application Sep. 29, 1976, Ser. No. 727,393

Int. Cl.[2] G06K *7/10, 19/06, 9/00*

U.S. Cl. 235—463 **20 Claims**



6. A method of translating records binary coded by a sequence of alternate areas of first and second light reflecting characteristics each of which can have one of more than two different widths using a light responsive reader, which method comprises the steps of

producing relative movement between the reader and the record so that the reader passes over all of the areas,

producing a sequence of digital reader-controlled signals in which each signal corresponds to the width of one of the areas, including at least a first signal, a second signal following the first signal in the sequence, and a third signal following the second signal in the sequence,

digitally comparing each two successive signals to determine the relative widths of successive areas, and in particular comparing the first signal to the second signal and comparing the second signal to the third signal,

and registering binary "1"s and "0"s in accordance with the relative widths of the successive areas.

4,108,369

AUTOMATIC FLUE DAMPER

John Prikkel, III, 2952 Ensley Ave., Dayton, Ohio 45414

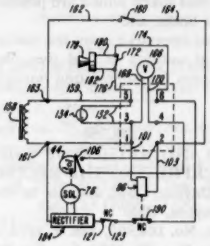
Filed Mar. 28, 1977, Ser. No. 781,649

Int. Cl.[2] F23L *11/00*

U.S. Cl. 236—1 G **15 Claims**

1. In a mechanism for controllably venting gases from the flue of a combustion apparatus, said mechanism comprising a housing for mounting said flue and into which said gases pass, a damper mounted in said housing and movable between a first position opening said housing for the passage of gases therefrom and a second position substantially closing said housing against the passage of gases therethrough, the improvements comprising yieldable means biasing said damper to said first position, motive means for holding said damper against the bias of said yieldable means in said second position, heat sensor means disposed in said housing upstream of said damper for

disabling said motive means upon sensing heated gases in said housing and means for connection in circuit with said motive



means of a thermostat responsive to a medium heated by the combustion apparatus for also disabling said motive means.

4,108,370

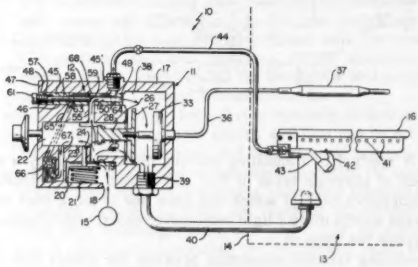
FUEL CONTROL SYSTEM HAVING BY-PASS MEANS AND PARTS THEREFOR AND THE LIKE

Roy C. Demi, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 23, 1977, Ser. No. 771,165

Int. Cl.[2] F23N *1/00*

U.S. Cl. 236—15 A **27 Claims**



1. In a fuel control system having temperature responsive control means for thermostatically controlling the flow of fuel from a source thereof to a burner means and having adjustable by-pass means by-passing said temperature responsive means for providing a by-pass flow of fuel from said source to said burner means to sustain combustion at said burner means, the improvement wherein said by-pass means comprises a tubular member provided with an inlet and an outlet for respectively being interconnected to said source and said burner means, said tubular member having a passage therein interconnecting said inlet to said outlet, and an adjusting member carried by said tubular member for adjusting the rate of flow of fuel through said passage between said inlet and said outlet of said tubular member and, thus, the amount of fuel being by-passed to said burner means, said tubular member having means for interconnecting said source to a pilot burner means independent of said passage thereof.

4,108,371

DAMPER CONTROL DEVICE

Louis J. Leemhuis, 1855 Sherington Pl. Apt. M214, Newport Beach, Calif. 92663

Filed Dec. 9, 1976, Ser. No. 749,160

Int. Cl.[2] F16K *31/12*; F24F *11/04*

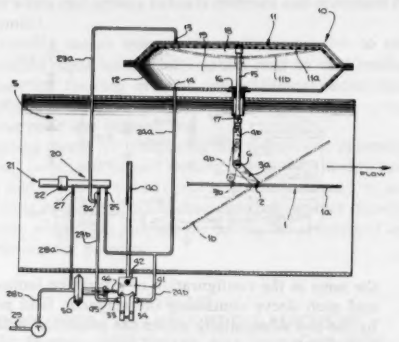
U.S. Cl. 236—49 **14 Claims**

1. In a fluid flow control device for controlling the volume of fluid flow through a conduit to a zone, said device comprising damper means for regulating fluid flow through said conduit to said zone and damper control means for regulating said damper means, the improvement in said damper control means comprising:

fluid supply means including tube means in said conduit facing into said fluid flow for receiving and diverting a portion of said fluid flow in said conduit:

transducer means including first and second pressure chambers devided by a movable diaphragm means for moving said damper means in response to movement of said diaphragm means;

means for deviding and directing said portion of said fluid flow to said first and second chambers to apply the same fluid pressure of said fluid flow to opposite sides of said diaphragm means;



vent means for selectively venting either of said first and second chambers; and

vane means including a vane member in said conduit responsive to fluid flow within said conduit and connected to said vent means for operating said vent means to selectively vent either of said first and second chamber to operate said damper means in response to fluid flow in said conduit whereby a constant volume fluid flow can be maintained in said conduit with said device being operated by said portion of said fluid flow diverted from said conduit and said vane means.

4,108,372

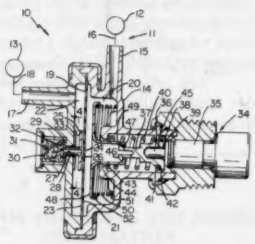
ENGINE CONTROL SYSTEM AND A DIFFERENTIAL VACUUM REGULATOR THEREFOR OR THE LIKE

Harold G. Brakebill, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 1, 1976, Ser. No. 672,593

Int. Cl.[2] G05D *23/02*

U.S. Cl. 236—86 **4 Claims**



1. A differential vacuum regulator comprising a housing means having an inlet for being interconnected to a vacuum source and an outlet for being interconnected to a vacuum operated device, and valve means carried by said housing means for interconnecting said inlet and said outlet together to produce a certain vacuum level at said outlet when said regulator is sensing a temperature below a certain temperature and

for interconnecting said inlet and said outlet together to produce a different vacuum level at said outlet when said regulator is sensing said certain temperature, said valve means comprising a temperature sensing device and a flexible diaphragm that is responsive to the vacuum at said inlet, said diaphragm having an inlet side that is exposed to said inlet and having an outlet side that is exposed to said outlet, said valve means comprising a biasing means for acting on said inlet side of said flexible diaphragm and being controlled by said temperature sensing device, said temperature sensing device rendering said biasing means inactive by holding said biasing means away from said inlet side of said diaphragm when said temperature sensing device is sensing a temperature below said certain temperature and rendering said biasing means active by causing said biasing means to engage and act on said inlet side of said diaphragm when said temperature sensing device is sensing said certain temperature.

4,108,373
METHOD AND AN INSTALLATION FOR THE AIR-CONDITIONING OF GREENHOUSES AND FRAMES

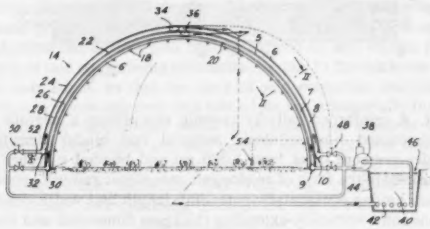
Jean-Pierre J. Chiapale, Le Pontet; Jacques A. Damagnez, Villeneuve-les-Avignon; Pierre M. Denis, Grenoble, and Paul Jourdan, Meylan, all of France, assignors to Commissariat a l'Energie Atomique and Institut National de la Recherche Agronomique, both of Paris, France

Filed May 14, 1975, Ser. No. 577,358

Claims priority, application France, May 22, 1974, 74 17921; Mar. 19, 1975, 75 08616

Int. Cl.[2] F24J *3/02*; A01G *9/00*

U.S. Cl. 237—1 A **9 Claims**



1. A method of day and night air-conditioning of an enclosure in which plants are cultivated, at least part of the roofing structure of said enclosure being made up of at least two walls transparent to solar radiation delimiting an intermediate space which is filled with a heat-transporting liquid, wherein:

(a) during the daytime, the penetration of the solar energy within said enclosure is selectively limited by making use of an optical filter constituted by said liquid containing an additive for selectively absorbing all radiant energy of wavelengths exceeding a threshold value that lies within the range of 6,000 A to 7,500 A and having no potential usefulness for the productivity and growth of the plants, at the same time permitting the greater part of the solar radiant energy that is ptotentially useful to green plants to be absorbed by the leaves of the plants under cultivation,

(b) during the daytime, the heat absorbed is removed by circulating said liquid in a closed circuit and is stored in a reservoir which is separate from the space formed between said walls,

(c) during the night, a minimum temperature is maintained within the enclosure by circulating said liquid within said intermediate space,

(d) measuring the radiative temperature of the plant cover within the enclosure,

(e) determining a top threshold value of a radiative temperature which is slightly lower than the maximum permissible limit and a bottom threshold value which is slightly higher than the minimum permissible limit, and

(f) circulating the heat-transporting liquid during the daytime as long as said radiative temperature exceeds said top threshold value and circulating the heat-transporting liquid during the night as long as said radiative temperature is lower than said bottom threshold value.

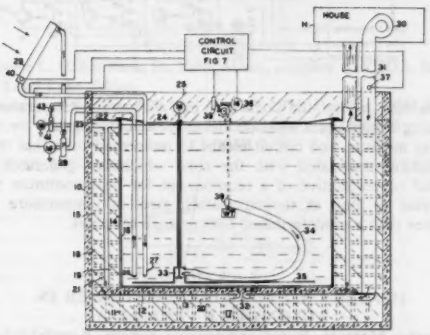
4,108,374
HEAT STORAGE WATER TANK

Floyd A. Lyon, Brookville, and Henry Harrison, Locust Valley, both of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Jul. 29, 1976, Ser. No. 709,587

Int. Cl.[2] F24D *11/00*

U.S. Cl. 237—1 A **6 Claims**



6. A heat storage tank suitable for solar house heating systems, including:

a rigidly supported bottom panel,

a heat exchanger mounted under said bottom panel,

a bottom air passage connected to said heat exchanger,

rigidly braced side panels connected to said bottom panel having an inner layer of outside insulation and an outer layer of outside insulation, a continuous side air passage between them, a plenum chamber near the top of said side panels communicating with said air passage whereby air may pass from said bottom air passage through said heat exchanger, through said side air passage to said plenum chamber;

means connected for transferring heat from a heat source to water contained in said tank, and heat deliver fluid means for delivery of heat from said tank,

means connected to said tank for circulating water from a controllable height within said tank to the inside bottom surface of said tank, and means in said tank for constraining said circulating water to flow over the inside bottom surface of said tank, whereby the temperature of said tank inside bottom surface is kept substantially equal to the temperature of water at said controllable height.

4,108,375
CONTROL DEVICE AND PROCESS FOR HEATING AN INSTALLATION

Lawrence V. Keeney, Saddlebrook, N.J., assignor to Energy Conservation Devices, Inc., Palisades Park, N.J.

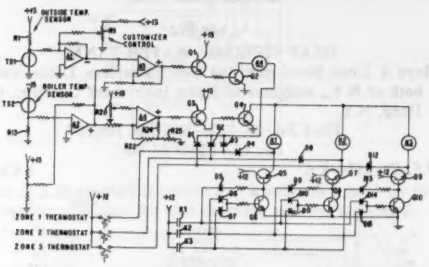
Filed May 13, 1977, Ser. No. 796,654

Int. Cl.[2] F24D *3/02*

U.S. Cl. 237—8 R **17 Claims**

1. A control means for regulating the operation of a circulating fluid medium system for maintaining the desired temperature within an enclosure having one or more circulating zones comprising: first means for sensing the temperature of the circulating medium at the point of heating and the temperature outside the enclosure and making a comparison between the

two; second means for controlling the input of heat to the circulating medium based on the results of said comparison between the temperature of the circulating medium at the point of heating and outside temperature to the minimum temperature whereby the demand of temperature within each zone is satisfied; and third means for generating a signal representative of the temperature within any zone in the enclosure, wherein



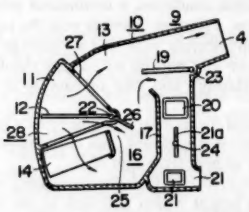
each zone within the enclosure has a separate temperature sensing means and a separate means for circulating said circulating medium, and circuit means so connected such that the circulator associated with the zone which last generates a signal representative of a requirement for heat continues to operate as long as the circulating medium temperature is higher than a predetermined temperature set point.

4,108,376

HEATER UNIT FOR AIR-CONDITIONER IN AUTOMOBILE VEHICLE

Tamotsu Matsuda, Wako, and Hiroshi Kuroda, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 679,576, Apr. 23, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,561
Claims priority, application Japan, Apr. 30, 1975, 50-59181
Int. Cl.[2] B60H *1/02*
U.S. Cl. 237—12.3 A **2 Claims**



1. A heater unit for air-conditioner in automotive vehicles which comprises, in combination:

(a) a heat exchanger to warm external cool air introduced into the heater unit through a fresh air inlet opening;

(b) a first bypass provided above said heat exchanger, and to lead the cool air current introduced into the heater unit to the upper part of the vehicle cabin;

(c) a first damper for distributing the cool air current introduced into said heater unit to both said heat exchanger and said first bypass, said first bypass being closed at the time of the maximum warming operation and an entrance to said heat exchanger being closed at the time of the cooling operation by said first damper;

(d) a guide passageway to introduce warm air current which is discharged from said heat exchanger into the cool air current in said first bypass from below at a substantially vertical angle;

(e) a downwardly directing passageway extending from the vicinity of a merging point of said both warm and cool air currents to a plurality of downwardly directing outlet openings in the vehicle cabin in substantially parallel with said guide passageway through a partition wall;

(f) a second damper provided in the vicinity of the merging point of said both warm and cool air currents, and to distribute a major portion of the cool air current through said first bypass to a plurality of upwardly directing current, and a major portion of the warm air current through said downwardly directing passageway to the downwardly directing outlet openings in the vehicle cabin along with a portion of the cool air current;

(g) a second bypass provided at one side of said heat exchanger, and to lead a portion of the cool air current distributed to said heat exchanger by said first damper to the discharging side of said heat exchanger; and

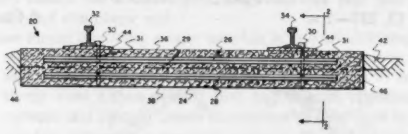
(h) a third damper provided in said second bypass, said third damper being formed integrally with said first damper so as to control the flow rate of the air current through said second bypass corresponding to the position of said first damper.

4,108,377

NON-METALLIC-REINFORCED MOLDED CROSSTIE

Edward Potter, 14415 SW. 6th, Beaverton, Oreg. 97005, assignor to Edward Potter, Beaverton and Dant & Russell, Inc., Portland, both of, Oreg.

Continuation-in-part of Ser. No. 588,786, Jun. 20, 1975. This application Mar. 1, 1976, Ser. No. 662,703
Int. Cl.[2] E01B *3/44*
U.S. Cl. 238—91 **16 Claims**



1. A reinforced railway crosstie comprising a mixture of comminuted lignocellulosic material and binder densified under pressure of at least 1,200 psi and bonded together as densified in the form of an elongate monolithic railway crosstie beam having horizontally-extending length and width dimensions and a vertically-extending thickness dimension, and elongate reinforcing means for strengthening and stiffening said crosstie against bending stress positioned longitudinally within said beam, said reinforcing means being made of wood having substantially straight, clear grain running parallel to the length dimension of said beam, said wood having a tensile strength and modulus of elasticity greater than that of said bonded mixture and being able to withstand compression of at least 1,200 psi applied in a direction transverse to said grain without fracture.

4,108,378

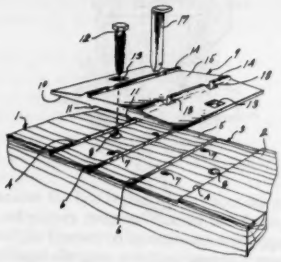
RAILROAD TIE AND TIE PLATE WITH COACTING GROOVES AND PROJECTIONS THAT PREVENT SPIKE KILLING OF THE TIES

Roger Raymond, 720 Leclerc St., Acton Vale, Canada

Filed Apr. 7, 1977, Ser. No. 785,414
Int. Cl.[2] E01B *13/02*
U.S. Cl. 238—298 **2 Claims**

1. A railroad tie and tie plate assembly comprising, in combination, a wood tie having a top face and a pair of spaced rabbetted shallow recesses formed into said top face, each recess having a flat bottom surface intermediate a pair of substantially parallel straight shoulders extending substantially orthogonally to said bottom surface and to the length of said wood tie, said bottom surface further having a pair of pre-cut straight grooves made therein, substantially parallel to said shoulders and spaced from each other and from said shoulders, and for

each recess, a tie plate made of metal and having a flat underface, straight and parallel side edges and a top surface defining a central surface portion and on each side of said central surface portion a marginal surface portion downwardly inclined from said central surface portion toward the respective side edge and merging with the latter, said tie plate being thicker in the zone of said central surface portion than at said side edges, and further having a pair of spaced parallel ribs integral with said tie plate and upstanding from said top face at the junction of said central surface portion with the respective marginal surface portion, said ribs being substantially parallel with said side edges and adapted to position the sole of a rail resting on said central surface portion, and a pair of straight, spaced parallel ridges integrally formed with said tie plate and protruding from the underface thereof, and complementary to said



grooves, the distance between said side edges being substantially equal to the distance between said shoulders and the distance between the respective ridges and the adjacent side edge of said tie plate being substantially equal to the distance between the respective groove and the adjacent shoulder of said recess, so that said tie plate fits said recess and said ridges fit said grooves without any appreciable lateral play with said underface flat against said bottom surface of said recess, the depth of said recess being substantially equal to the thickness of said side edges, so that the zone of said respective marginal surface portions adjacent said side edges are substantially flush with the top face of said wood tie in their zone adjacent the respective side edges, and said central surface portion is at a higher level than that of said top face of said wood tie, and said tie plate further including spike-receiving apertures made therethrough and extending through the respective ribs.

4,108,379

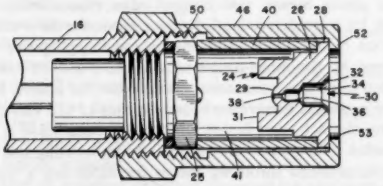
PAINT SPRAY TIP RETAINING AND CLEANING ADAPTER

Herbert Joseph Talley, 1241 Rock Springs Rd., San Marcos, Calif. 92069

Continuation-in-part of Ser. No. 644,763, Dec. 29, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 780,027

Int. Cl.[2] B05B *15/02*

U.S. Cl. 239—119 **6 Claims**



1. A cleaning adapter adapted for use with a spray gun of the type having a unidirectional non-reversible spray tip of the type having a barrel with an orifice at one end and an annular retaining flange at the other end detachably mounted normally by a retainer nut directly to the spray gun housing at the outlet of the spray control valve, said adapter comprising:

an elongated inner sleeve having an inner diameter for accommodating said barrel of said spray tip in the reverse direction and having a length exceeding the length of said spray tip between said retaining flange and said one end for accommodating said tip in the reverse direction and having an inner end for engaging said spray gun housing and an outer end for engaging said retaining flange; and

an elongated retaining sleeve having an inner end for engaging said housing, a length and a diameter for accommodating said spacer sleeve and said barrel of said tip and an inwardly extending flange at the outer end for engaging said retaining flange for accommodating and retaining said tip on the outer end of said sleeve in either the forward direction for normal spraying or in a reverse direction for dislodging debris from the orifice of said tip.

4,108,380

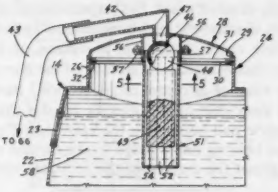
TANK SPREADER

James L. Richardson, St. Paul, Minn., assignor to VEDA, Inc., Long Lake, Minn.

Division of Ser. No. 500,133, Aug. 23, 1974, Pat. No. 4,061,273. This application Mar. 10, 1977, Ser. No. 776,229

Int. Cl.[2] B05B *1/20*

U.S. Cl. 239—172 **34 Claims**



1. A liquid manure spreader comprising: a tank having a chamber for storing liquid manure, said tank having a top portion with a passage open to the chamber, a cover mounted on the tank for closing said passage, means to support the tank for movement along the ground, pump means for selectively evacuating air from the chamber and supplying air under pressure to the chamber, control valve means having a single spool to selectively control the movement of air to and from the tank, a single air line means connecting the valve means with the cover, manure discharge means on the tank for spreading manure when air under pressure is supplied to the tank, manure inlet means allowing manure to move into the tank when air is evacuated from the tank, safety shut-off valve means located inside the tank operable to prevent the evacuation of air from the tank through the air line means in response to the level of the manure in the tank, said shut-off valve means including a valving member, an elongated float for moving the valving member to a closed position in response to the level of the manure in the tank to prevent escape of liquid manure into the line means and pump means, said air line means including a tubular member mounted on the cover, said tubular member having a projection extended below the cover and engageable with said valving member to close the air line means, open cage means secured to said cover and extended downwardly into the tank chamber to confine the valving member and float, said cage means having a plurality of rigid members spaced from each other and surrounding the valving member and float, said spaced members providing elongated openings between the chamber and float whereby the float responds to the level of liquid in the tank chamber to close the air line means, and means attaching the rigid members to the inside of the cover, said means attaching the spaced members to the inside of the cover comprise legs secured to the cover and releasable fastening means connecting the spaced members to the legs

whereby the spaced members, valving member and float can be removed from the cover.

4,108,381

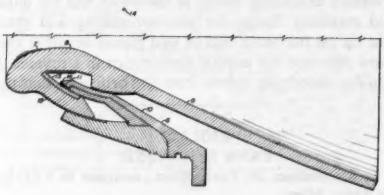
ROCKET NOZZLE BEARING SEAL

Philip C. Sottosanti, Ogden, Utah; William H. Baker, Orangevale, Calif., and William T. Dolling, Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Jun. 6, 1977, Ser. No. 803,487

Int. Cl.[2] B64C *15/04*

U.S. Cl. 239—265.35 **8 Claims**



1. In a thrust vectoring, convergent-divergent, nozzle for rockets, having a movable member containing a throat and expansion cone attached, for rotation, to a stationary member that is to be fixed to a rocket that generates high temperature, high pressure, erosive gases, the improvement comprising:

an annular, elastomeric pad bonded into an annular groove, of arcuate cross section, in a surface of the stationary member that is adjacent a surface of the movable member;

a torsion ring of arcuate cross section, having a radius shorter than that of the groove by the thickness of the elastomeric pad bonded to the elastomeric pad; and

a lubricous bearing pad bonded to the torsion ring, so that it bears against the surface of the movable member.

4,108,382

SPRAYING DEVICE

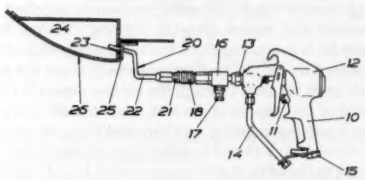
Per-Olof Ryd, and Sten Gunnar Hugo Svensson, both of Skara, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 16, 1976, Ser. No. 751,212

Claims priority, application Sweden, Dec. 18, 1975, 7514316; Dec. 19, 1975, 7514486

Int. Cl.[2] B05C *5/02*

U.S. Cl. 239—271 **9 Claims**



1. Spraying device for applying a coating material on the inner walls of a hollow body through an injection opening in the latter, comprising:

a spray gun having a coating material valve,

an ejector barrel connected downstream of the coating material valve for conducting coating material into the hollow body through the injection opening, and

a positioning means inluding means for engaging the outside of the hollow body for fixing said ejector body at a predetermined direction relative to the hollow body, at a predetermined depth of intrusion in the hollow body and at a predetermined angular position in said hollow body, and for substantially preventing relative movement between said ejector barrel and said hollow body during spraying.

4,108,383

FUEL INJECTION VALVE WITH STEPPED INJECTION

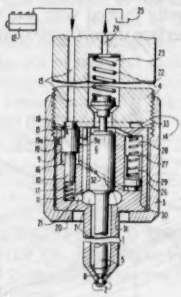
Frank Thoma, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 1, 1976, Ser. No. 662,421

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1975, 2509068

Int. Cl.[2] B05B *1/32*

U.S. Cl. 239—533.5 **34 Claims**



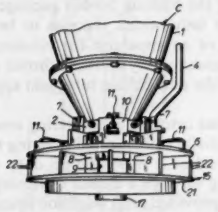
1. A fuel injection valve for internal combustion engines, comprising valve housing means provided with discharge opening means, a valve needle means actuatable in the closing direction by a valve needle closure spring and in the opening direction by the pressure of the fed fuel, a pressure space means formed together with the valve housing means and receiving the valve needle means, said pressure space means being operable to be closed against the outside by a valve seat means for the valve needle means and formed by said housing means, said discharge opening means being located downstream of said valve seat means and representing a predetermined flow resistance, at least two piston means kinematically operatively coupled with one another in at least one direction of movement, said piston means being reciprocable between two axial positions, pressure space means on the inlet-side and outlet-side of the piston means, a return spring positioned on the outlet side of said piston, said piston means being actuatable on the inlet-side thereof by the pressure of the supplied fuel and on the outlet-side also by said return spring, a first essentially unobstructed line connection means operatively connecting the outlet-side piston pressure space means of one of the piston means with the pressure space means of the valve needle means, control edge means defining the axial end of a hollow housing space means open to the piston slide surface of the other piston means, said control edge means being axially offset by a predetermined distance from the inlet-side axial position of the other piston means and being operable to be covered by the other piston means, and a second essentially unobstructed line connection means from the hollow housing space means to the pressure space means of the valve needle means, characterized in that said fuel injection valve is further provided with a reservoir means and a connecting line having a predetermined throttling means for achieving a throttling resistance which is greater than that which exists in said first and second unobstructed connecting line means, and wherein the outlet-side pressure space means of the other piston means is operatively connected with the reservoir means by way of said connecting line means having said predetermined throttling means.

4,108,384

CENTRIFUGAL SLINGING APPARATUS FOR HOT REPAIR OF ELECTRIC FURNACES, LADLES OR THE LIKE

Ernst Egli, Dietikon, Switzerland, assignor to Spribag Aktiengesellschaft, Widen-Mutschellen, Switzerland

Filed Nov. 26, 1976, Ser. No. 745,399
Claims priority, application Switzerland, Nov. 27, 1975, 15415/75
Int. Cl.[2] F27D *1/16*
U.S. Cl. 239—665 12 Claims



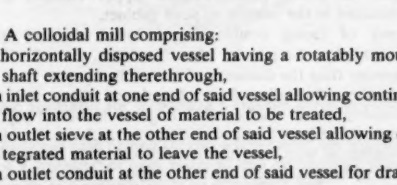
1. Apparatus for hot repair of furnaces by precision centrifuging of refractory material against the damaged location of the lining of the furnace to be repaired, said apparatus comprising a centrifugal slinging machine having a generally horizontally disposed centrifuging wheel to which the refractory material is introduced from above, said centrifuging wheel having a central, upwardly opening chamber, means for dividing said chamber into radial sectors, individual and independently liftable and lowerable metering sliders for selectively and variably closing said sectors.

4,108,385

COLLOIDAL MILL

Friedrich Funk, Refugium, 4713 Matzendorf, Switzerland

Filed Jun. 29, 1976, Ser. No. 701,030
Claims priority, application Switzerland, Jul. 9, 1975, 8941/75; Apr. 27, 1976, 5263/76
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—46.04 5 Claims



1. A colloidal mill comprising:

a horizontally disposed vessel having a rotatably mounted shaft extending therethrough,

an inlet conduit at one end of said vessel allowing continuous flow into the vessel of material to be treated,

an outlet sieve at the other end of said vessel allowing disintegrated material to leave the vessel,

an outlet conduit at the other end of said vessel for draining the treated material,

a plurality of grinding impellers mounted on said shaft for rotation in said vessel, each impeller comprising a blade which has an axial conveying action and the impellers acting to agitate and rotate said material to be treated, each grinding impeller blade being adjustable in inclination and easily replaceable, at least the outer surfaces of said impeller blades and the inner surface of said vessel in contact with the material being of ceramic material; at least two intermediate grinding impellers have an axial conveying action in opposite directions,

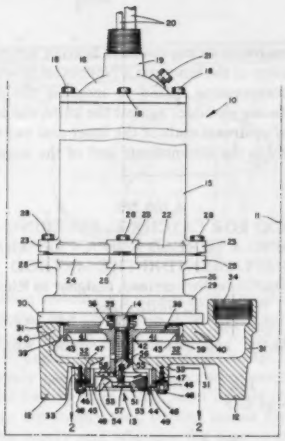
said grinding impellers each comprising a boss rigidly mounted to said shaft, flat blades each removably secured in a holder has a U-shaped profile which receives an edge of the blade and a pin engaging in a bore of the boss.

4,108,386

GRINDER PUMP

William J. Conery, and Terry L. Kiplinger, both of Ashland, Ohio, assignors to McNeil Corporation, Akron, Ohio

Filed Apr. 13, 1977, Ser. No. 787,081
Int. Cl.[2] B02C *18/40*
U.S. Cl. 241—46.11 13 Claims



1. A grinder pump comprising an axial inlet, a pumping chamber communicating with said inlet, a rotatable shaft extending axially through said chamber and into said inlet, pump impeller means on said shaft outside of but communicating with said chamber, annular ring means in said inlet having teeth forming the internal diameter thereof, impeller means on said shaft and rotatable therewith within said ring means, said impeller means including a disk member the external diameter of which generally corresponds to the internal diameter of said ring means, and at least one blade member extending generally axially of said disk member out of said inlet further than the axial extent of said ring means so that upon rotation of said shaft said pump impeller draws material through said teeth of said ring means and into said chamber for discharge therefrom.

4,108,387

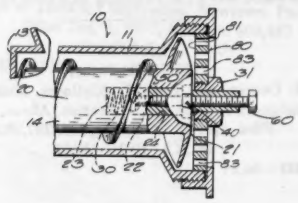
HOLLOW PIN ASSEMBLY FOR FOOD GRINDERS

James G. Weiler, Elkhorn, Wis., assignor to Weiler and Company, Whitewater, Wis.

Filed Mar. 25, 1977, Ser. No. 781,240
Int. Cl.[2] B02C *18/36*
U.S. Cl. 241—82.5 6 Claims

1. In a food grinder comprising an auger tube containing an auger and having at its downstream end a perforated plate against the upstream face of which a rotating knife is biased, the improvement comprising an external adjusting means at the downstream end of the grinder to adjust the bias of the knife against the upstream face of the perforated plate, and internal bias means controlled by said external adjusting means without disassembling any part of said grinder, the external adjusting means comprising an inner screw threaded pin having an upstream end and a downstream end, and the internal bias means to adjust the bias of the knife comprising an outer

pin in concentric threaded relation to the inner pin, and a compression spring; said inner pin having its upstream end biased by the compression spring and its downstream end accessible from the outside of the grinder; and said outer pin being non-rotatable respecting said auger and said knife and



having a downstream facing shoulder bearing against the knife, whereby rotation of the inner pin advances its downstream end against the compression spring to increase the bias of said downstream facing shoulder against the knife, the compression spring and the upstream ends of the inner and outer pins lying within a cavity in the downstream end of the auger.

4,108,388

METHOD FOR CATCHING, SEVERING AND RETHREADING A THREAD AND AN APPARATUS FOR IMPLEMENTING THE METHOD

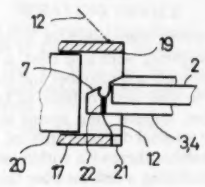
Hugo Schär, Dattlikon, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Apr. 7, 1976, Ser. No. 674,655

Claims priority, application Switzerland, Apr. 16, 1975, 4830/75

Int. Cl.² B65H *67/04, 54/26*

U.S. Cl. 242—18 DD **12 Claims**



1. A method of catching, severing and sucking-off a continuously arriving thread and rethreading said thread onto a new empty bobbin tube, comprising the steps of:

continuously infeeding a thread onto a bobbin tube to form a bobbin package thereon while the thread moves through a thread traversing triangle;

building-up the bobbin package by means of an infed thread on the bobbin tube;

displacing a common thread catching and severing device having knife blades into the zone of the thread traversing triangle when the bobbin package is built-up to a desired size;

initially catching the thread with the knife blades of the common thread catching and severing device within the zone of the thread traversing triangle;

holding and severing the thread by means of the knife blades of the common thread catching and severing device;

continuously sucking-off the incoming thread end by means of a suction device;

retracting such thread end from the zone of the built-up bobbin package;

carrying out a bobbin tube change by removing the built-up bobbin package and inserting a new empty bobbin tube;

following the bobbin tube change laterally inserting the thread end into the new empty bobbin tube;

engaging the thread by means of the new empty bobbin tube;

simultaneously severing the thread with the knife blades from the thread end extending to the suction device when the incoming thread has been positively caught by the new empty bobbin tube; and

thereafter shifting the common thread catching and severing device back into an idle position.

3. The combination with an automatic thread winder for winding-up a continuously arriving thread onto a bobbin tube to form a bobbin package thereon and a bobbin change apparatus for removing the built-up bobbin package and inserting a new bobbin tube onto which there is to be formed a new bobbin package, of an apparatus for catching, severing and sucking-off the continuously arriving thread and rethreading such thread onto the new bobbin tube, said apparatus comprising:

a common thread catching and severing means having knife blades for initially catching and severing the continuously arriving thread as it is wound-up onto the bobbin tube while moving through a thread traversing triangle;

suction means provided with a suction opening cooperating with the common thread catching and severing means;

said knife blades being provided with a common guiding, catching and severing zone;

said common guiding, catching and severing zone being located at the vicinity of the suction opening;

means for supporting and enabling displacement of the common thread catching and severing means into the zone of the thread traversing triangle, for retracting said common thread catching and severing means from the zone of the thread traversing triangle after the continuously arriving thread has been severed by the knife blades of said common thread catching and severing means and the thread end sucked-off by the suction means and, following the bobbin tube change operation, for enabling the common thread catching and severing means together with the sucked-off thread end to be displaced into an end face of the new bobbin tube where the thread is rethreaded onto the new bobbin tube and simultaneously severed by the knife blades after rethreading; and

means for driving the common thread catching and severing means throughout the entire catching, severing, sucking-off and rethreading processes.

4,108,389

DISPENSER FOR A PLURALITY OF ROLLS OF SHEET MATERIAL

Rolla J. Womack, P.O. Box 56, Dawson, Ill. 62520

Filed Nov. 7, 1977, Ser. No. 848,905

Int. Cl.² B65H *19/04*

U.S. Cl. 242—55.3 **8 Claims**

1. A dispensing cabinet for dispensing a plurality of rolls of paper rolled on hollow cores, comprising

a pair of facing double-flanged upper channel tracks mounted in the interior of such cabinet,

a pair of facing double-flanged lower channel tracks mounted in the interior of such cabinet, and of a length greater than the diameter of such rolled paper,

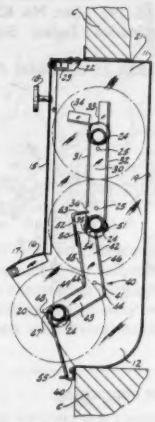
a plurality of spindles of such length and diameter as to fit slidably in said tracks and through such rolls of paper,

means at the lower end of said lower tracks to establish a position at which such rolled paper may be dispensed,

track openings adjacent to such position establishing means, whereby to permit removal of spindles and cores of spent rolls thereon,

both said pairs of tracks leading downward in said cabinet, one pair being fixed, the other pair being pivotable from a feed angle from which the lower end of each upper channel track is adjacent to and in registration with the corresponding upper end of said lower channel track to a stop angle in which the upper end of one flange of each of the

lower channel tracks is out of registration with the adjacent end of the upper channel track, each of the pair of lower tracks having an end projection presented, at said stop angle, intermediate the flanges of the corresponding upper tracks, whereby at such stop angle spindles bearing a roll of paper will be retained atop the end projections of the lower channels in a storage position, and



means to move said pivotable pair of tracks together angularly from such stop angle to such feed angle,

whereby after removal of a spent roll and its spindle, angular pivoting of said pivotable channel tracks will cause a second spindle and a roll thereon to descend from such storage position to such dispensing position.

4,108,390

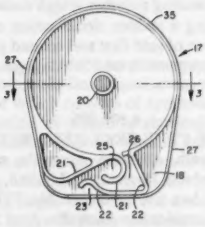
PAPER TAPE CANISTER

Hugh V. Hayes, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 15, 1977, Ser. No. 768,799

Int. Cl.[2] B65H *19/00*

U.S. Cl. 242—55.53 **4 Claims**



1. An apparatus for dispensing a flexible material comprising:

an enclosed case having therein a first cavity for the storage of a quantity of said material and an opening through which said material may be dispensed; and

a labyrinth formed by a plurality of curved partitions interior to said enclosed case, said labyrinth constituting a tortuous path connecting said first cavity and said opening for the passage of material from said first cavity to said opening, said labyrinth further including a plurality of second cavities formed by said partitions, said second cavities disposed with respect to said path such that material reinserted into said opening will be directed thereinto, thereby prohibiting the reinsertion into said first cavity of material once removed therefrom.

4,108,391

FEEDING SYSTEM FOR MANUFACTURING MACHINES CONSUMING PAPER SUPPLIED IN A CONTINUOUS STRIP

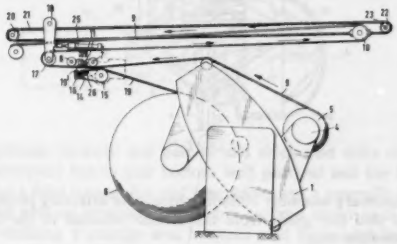
D. Manuel Torres Martinez, Sancho El Fuerte, 21 Pamplona, Spain

Filed Dec. 29, 1976, Ser. No. 755,145

Claims priority, application Spain, Feb. 20, 1976, 218.966[U]; Oct. 16, 1976, 223.836[U]

Int. Cl.[2] B65H *19/14*

U.S. Cl. 242—58.3 **8 Claims**



1. In a feeding system for manufacturing machines consuming paper supplied in a continuous strip having a first roller for holding a supply reel of paper, a second roller for holding a reserve reel of paper, means for guiding and feeding the strip from said supply reel to said manufacturing machines, means for joining the leading edge of the paper on said reserve reel to the strip from the supply reel, cutting means for cutting the strip from the supply reel whereby the reserve reel is substituted for the supply reel, the improvement comprising:

(a) means for holding a transverse strip of said strip from the reserve reel;

(b) said means for holding having means for forming a buckle completely across said transverse strip said buckle being concave toward the strip from the supply reel;

(c) contacting means for contacting the end of said strip from the reserve reel with the strip being supplied from the supply reel;

(d) contact adhesive means for adhering the end of said strip from the reserve reel to the strip from the supply reel; and

(e) said cutting means being operative to cut completely through the strip from the supply reel in a transverse location aligned with said buckle whereby the cutting means does not touch the strip from the reserve reel.

4,108,392

FISHING REEL

Jean Masclet, Paris, France, assignor to S.E.D.I.C., Montrouge, France

Filed Mar. 7, 1977, Ser. No. 774,999

Claims priority, application France, Mar. 26, 1976, 76 08788; Feb. 8, 1977, 77 03413

Int. Cl.[2] A01K *89/00*

U.S. Cl. 242—84.21 A **15 Claims**

1. A fishing reel having a body supporting a rotatable spool, a spool driving means, and a spool layering means; wherein:

said spool driving means comprises:

a principal shaft rotatably supported in said body;

a secondary shaft rotationally connected to said principal shaft, said spool being operatively associated with one end of said secondary shaft; and,

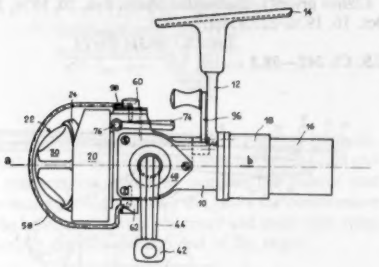
a frame rotatable about said principal shaft and including bearing means coupled with the other end of said secondary shaft and locating said secondary shaft at an angle of

inclination relative to said principal shaft, the arrangement being such that rotary movement of said principal shaft transmits a primary movement to said spool for rotation thereof about the axis of said secondary shaft; and

said spool layering means comprises:

a line guide pivoted about an axis fixed relative to said body;

a first assembly including means for pivoting said line guide from a first position in which the line can be wound onto said spool to a second position in which the line is unwound from said spool during casting;



a secondary assembly including means for effecting pivoting of said line guide from the second position to the first position; and,

means for transmitting a secondary movement to said spool ensuring suitable layering of the line onto said spool, said transmitting means including said frame for transmitting the secondary movement to said spool, said frame rotating said spool about the axis of said principal shaft.

4,108,393

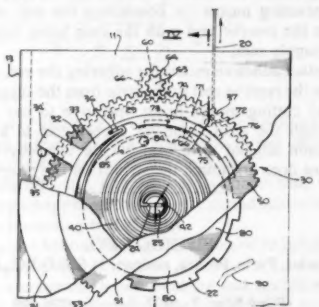
EMERGENCY LOCKING RETRACTOR WITH COMFORT BELT TENSION

Cyril Henderson, Woodland Hills, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Aug. 16, 1976, Ser. No. 714,395

Int. Cl.[2] A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107 **15 Claims**



1. In a safety belt retractor having a belt storage spool and a single spool rewind spring means connected at one end to said spool to produce a first rewind bias on said spool, the improvement in means for reducing the tension applied to the belt when in use due to the bias of said single rewind spring means, comprising the provision of:

means for selectively connecting an opposite end of said spring means to said spool, said means for selectively connecting including means for providing an opposite biasing effect on said spool of a lesser amount than that applied by said one end on said spool, whereby the net effect on said spool will be a second rewind bias on said spool by said single rewind spring means of a lesser amount than said first bias.

4,108,394

SEATBELT RETRACTOR FOR MOTOR VEHICLES

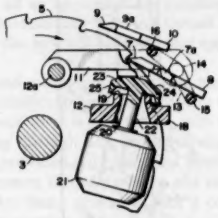
Susumu Oishi, Nagoya, and Masahiro Iwatsuki, Toyoake, both of Japan, assignors to Tokai-Rika-Denki-Seisakusho, Japan

Filed Sep. 16, 1977, Ser. No. 833,819

Claims priority, application Japan, Sep. 17, 1976, 51-125549[U]

Int. Cl.[2] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A **6 Claims**



1. A seatbelt retractor comprising:

a frame;

a retracting shaft rotatably coupled to said frame which retracts a seatbelt thereon;

at least one locking gear coupled to said retracting shaft;

first and second pawls provided adjacent said locking gear and independently rotatably coupled to said frame such that when said first and second pawl rotate they respectively engage with said locking gear and prevent rotation of said retracting shaft in a seatbelt extending direction;

a rocker arm pivotally supported at a pivot point and having a first catch pin at one end thereof which engages with said first pawl and a second catch pin at the other end thereof which engages with said second pawl such that the first pawl is caused to engage with said locking gear when said rocker arm rotates in one direction about said pivot point and such that said second pawl is caused to engage with said locking gear when said rocker arm rotates in the other direction about said pivot point; and

an acceleration sensing member which causes the pivot point to move during a sudden deceleration of a vehicle such that at least one of said first and second pawls is caused to rotate and engage with said locking gear.

4,108,395

PRESSURE-FREE SEAT BELT RETRACTOR

Robert Boyson Heath, Adelaide, Australia, assignor to Rainsfords Metal Products Proprietary Limited, Australia

Filed Aug. 25, 1976, Ser. No. 717,488

Claims priority, application Australia, Aug. 26, 1975, 2923/75

Int. Cl.[2] A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107.7 **15 Claims**

1. A pressure free device for a seat belt wherein the belt is carried on a spool which is rotational in a frame and has biasing means urging spool rotation in a belt retraction direction, comprising:

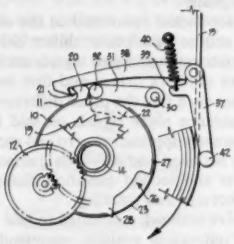
retraction inhibiting means coupled to the spool, and a retraction inhibiting member movable with respect to the frame and releasably engageable with said inhibiting means to inhibit said rotation in the belt retraction direction,

a gate latch movable with respect to the frame,

a gate member mounted for rotation with respect to the frame and clutch means coupling said gate member to said spool, and having associated therewith both a cam surface

engaged by said inhibiting member, and a gate latch engagement surface engageable by said gate latch to restrain gate member rotation in a latch restrained position upon belt withdrawal, and

gate latch release means operable to release said latch from



its engagement with said engagement surface when the gate member rotates upon belt retraction,

said cam surface controlling said inhibiting member to engage said inhibiting means only when the gate member rotates upon belt withdrawal beyond its latch restrained position.

4,108,396

BOBBIN FOR TEXTILE YARNS OR THE LIKE

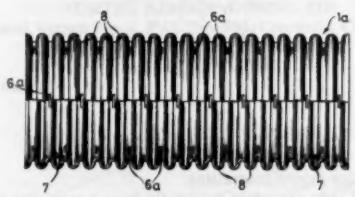
Adalbert Engel, Drosselweg 4, Lörrach, Fed. Rep. of Germany (7850)

Filed Feb. 9, 1976, Ser. No. 656,713

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1975, 2506512

Int. Cl.[2] B65H *75/20*

U.S. Cl. 242—118.11 **19 Claims**



1. A bobbin for heat- and/or wet-treatment of textile yarns or the like, comprising a hollow liquid-permeable tubular body at least a portion of which consists of synthetic plastic material and at least a portion of which is elastically deformable in radial and axial directions thereof without appreciable changes in the configuration of the internal surface of said hollow body, said body having substantially circumferentially extending alternating abutting larger-diameter and smaller-diameter sections, each of said larger-diameter sections being a circumferentially complete section.

4,108,397

CADDY FOR KNITTING AND CROCHETING YARN

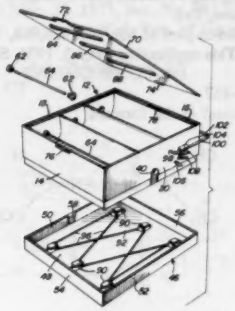
Dorothy M. Hauck, 415 E. Division St., Lockport, Ill. 60441

Filed May 16, 1977, Ser. No. 797,534

Int. Cl.[2] B65H *49/18*

U.S. Cl. 242—137.1 **10 Claims**

1. A caddy for various yarns to be used in knitting and crocheting, said caddy including an upwardly opening receptacle defining a plurality of upwardly opening individual recesses defined by upwardly concave bottom wall portions, a cover removably secured over the top of said receptacle and including openings formed there-through in vertical registry with said recesses and operative to slidingly receive yarn sections therethrough wound into hanks disposed in said recesses, said receptacle including two pairs of opposite upstanding sides, said bottom wall portions being semi-cylindrical and formed integrally with each other and said sides and extending



lengthwise between one pair of said sides, said sides extend downwardly below said bottom wall portions and the latter define a false bottom for said receptacle, and a generally horizontal bottom structure removably secured under said sides and defining a storage area between said horizontal bottom structure and said false bottom.

4,108,398

MAGNETIC RECORDING TAPE CARTRIDGE

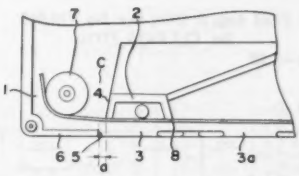
Noritsugu Hashimoto, and Shinichi Kagano, both of Kyoto, Japan, assignors to Hitachi Maxell, Ltd., Ibaragi, Japan

Filed Jun. 9, 1977, Ser. No. 805,032

Claims priority, application Japan, Jun. 10, 1976, 51/75837[U]; Jun. 10, 1976, 51/75842[U]

Int. Cl.[2] G03B *1/04;* G11B *15/32*

U.S. Cl. 242—199 **5 Claims**



1. A recording tape cassette having top and bottom cases defining an enclosure with a front wall having a plurality of apertures along the front edge thereof, a pair of guide means supported within the enclosure, a tape guide path extending between said guide means and adjacent said apertures, a pair of U-shaped guide walls having a height higher than the width of the recording tape and extending from either the bottom or the top of said cases, and adapted to extend behind the outermost apertures of the front wall and a pair of partition walls, each having a height substantially equal to about one-half of the inner height of the enclosure, each of said partition walls protrudingly extending from the top and bottom portions of said cases behind said plurality of apertures in the front wall of the enclosure and extending to cover all of said apertures, said partition walls being so arranged that the front surface of at least one of the end portions of a partition wall on one of the cases engages with the back surface of the corresponding U-shaped guide walls provided on the other case to cover said outermost aperture of the front wall of the case, said U-shaped guide wall acting as a stopping means through said engagement

with the partition wall to prevent transverse sliding between the top and bottom cases.

4,108,399

HERBICIDAL SEMICARBAZONES

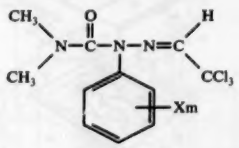
Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 283,686, Aug. 25, 1972, abandoned. This application May 2, 1974, Ser. No. 466,103

Int. Cl.[2] C07C *133/02*

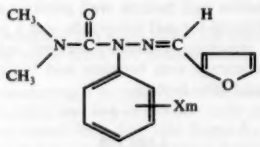
U.S. Cl. 542—417 **5 Claims**

1. A compound of the formula



wherein X is chlorine, and *m* is 2.

3. A compound of the formula



wherein *m* is 2 and one of X is chlorine and the other is fluorine.

4,108,400

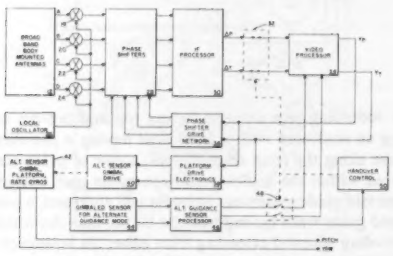
DUAL MODE GUIDANCE SYSTEM

Frederick D. Groutage, Bonita, and Gabriel S. Borunda, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1976, Ser. No. 710,965

Int. Cl.[2] F42B *15/10*

U.S. Cl. 244—3.15 **9 Claims**



1. A multimode missile guidance system comprising:

a missile radome;

an anti-radiation sensor mounted on said radome for outputting on first and second azimuth channels azimuth guidance plane signals and on first and second elevation channels elevation guidance plane signals;

a movable stabilized platform secured within said radome including drive means for positioning thereof;

an alternate mode guidance sensor mounted on said platform;

a first phase shifter means connected in at least one of said azimuth channels;

a second phase shifter means connected in at least one of said elevation channels;

a phase shifter drive network connected to said first and second phase shifter means;

an IF processor connected to the outputs of said first and second phase shifter means for developing detected video guidance signals;

video processor means connected to the output of said IF processor and to said phase shifter drive network for outputting d.c. pitch and yaw signals such that said phase shifter drive network drives said first and second phase shifter means such that the phase differential between said azimuth guidance plane signals on said first and second azimuth channels approaches zero and such that the phase differential between said elevation guidance plane signals on said first and second elevation channels approaches zero to effectuate null tracking;

a platform drive network connected to said video processor means for outputting position command signals to said movable platform drive means; and

an alternate mode guidance sensor processor having an input connected to said alternate mode guidance sensor and an output connected to said video processor means for outputting alternate mode detected video guidance signals.

4,108,401

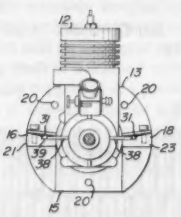
MOTOR MOUNT FOR USE IN MODEL AIRPLANE

Matthew A. Sullivan, Elkins Park, Pa., assignor to Sullivan Products, Inc., Willow Grove, Pa.

Filed Dec. 7, 1976, Ser. No. 748,339

Int. Cl.[2] B64D *27/00*; **F16M** *13/00*

U.S. Cl. 244—54 **11 Claims**



1. A motor mount comprising:

a pair of arms extending outwardly from a mounting plate;

said arms extending in their lengthwise dimension generally perpendicularly from said mounting plate;

said arms being spaced from one another to form a slot for receiving a motor;

each arm having a generally horizontal surface for contacting flanges of a motor to be mounted thereon and an angled surface spaced above and sloping toward said horizontal surface; and

clamping means mounted on said angled surfaces and adapted for contacting upper surfaces of the flanges of the motor and for securing the flanges of the motor between said clamping means and said horizontal surfaces.

4,108,402

AIRCRAFT EMERGENCY LETDOWN SYSTEM

Arthur D. Bowen, Phoenix, Ariz., assignor to Eleanor J. Bowen, Phoenix, Ariz., a part interest

Filed Jan. 13, 1977, Ser. No. 758,960

Int. Cl.[2] B64D *17/62*

U.S. Cl. 244—139 **5 Claims**

1. A removable emergency aircraft letdown system for aircraft, said system comprising in combination:

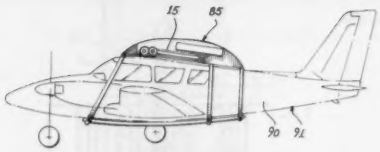
a. at least one positionable platform for supporting at least one parachute sized and configured to support the aircraft

at an acceptable rate of descent, each said platform being erectable from a first position to a second position;

b. erection means for erecting each said platform from the first position to the second position and deploying each parachute;

c. a pod juxtaposed with the top of the aircraft fuselage for storing each said platform and said erection means while each said platform is in the first position;

d. attachment means for securing the risers of each parachute to a point in general vertical alignment with the center of gravity of the aircraft;



e. actuation means for operating said erection means; and

f. strap means for securing said pod to said aircraft, said strap means extending downwardly from said pod to encircle the fuselage of the aircraft, said strap means includes a keel disposed longitudinally along the underside of the aircraft fuselage whereby, said system is detachably attachable to the aircraft to provide for descent by parachute of the aircraft in the event of an airborne emergency.

4,108,403

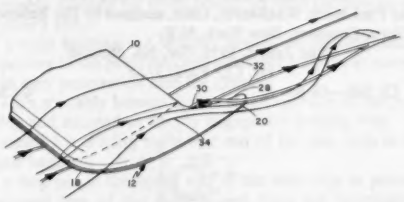
VORTEX REDUCING WING TIP

Reginald Vernon Finch, P.O. Box 934, Coronado, Calif. 92118

Filed Aug. 5, 1977, Ser. No. 822,134

Int. Cl.[2] B64C *21/00*

U.S. Cl. 244—199 **7 Claims**



1. A counter vortex airfoil tip for countering the vortex created by relative movement between the airfoil and a body of air, said tip comprising:

an inboard end for mounting on the outer end of an airfoil, the inboard end having a configuration substantially conforming to the profile of the airfoil to which said tip is mounted,

said airfoil tip defined by upper and lower surfaces extending outward and curving downward and extending aft at the outboard end thereof to a trailing tip extending approximately one half the length of the inboard end behind the trailing edge of the inboard end, said upper and lower surfaces joined at a leading edge that extends outward and curves downward to a lower edge that extends below the lower surface of said inboard end from the leading edge thereof to the trailing tip, and

said airfoil tip having an airfoil configuration in both its chordwise and spanwise direction.

4,108,404

ARRANGEMENT FOR PROTECTING DATA COMMUNICATION IN A CONTINUOUS AUTOMATIC TRAIN CONTROL SYSTEM

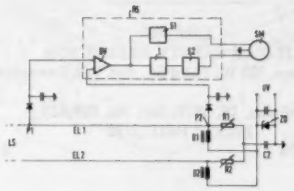
Helmut Ubel, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,827

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622270

Int. Cl.[2] B61L *21/08*

U.S. Cl. 246—34 CT **15 Claims**



1. Apparatus for protecting data communication between vehicles and track conductor loops in a continuous automatic train control system comprising:

track conductor loop means;

automatically controlled resistor means for terminating said track conductor loop means; and

closed loop control means having as a command variable the electrical current or potential difference existing between two points on said track conductor loop means as a result of the occurrence of a standing wave.

4,108,405

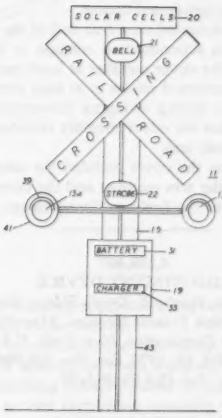
LIGHT ASSEMBLY AND FLASHER CIRCUIT

Preston H. Gibson, 226 Debbie Ann Ct., Auburndale, Fla. 33823

Filed Jun. 22, 1977, Ser. No. 809,115

Int. Cl.[2] B61L *23/08*

U.S. Cl. 246—125 **3 Claims**



1. A railroad crossing signal device comprising:

a. a T-shaped structure (15) with arm ends and lamp housing means at said ends, a center pole with a circuit housing, a battery charger and a battery compartment (19) thereat;

b. first and second bulb holders (25) in said lamp housing means, a shield (35) between said bulb holders, and an aperture (37) in said shield so that if one bulb is extinguished the remaining bulb will still provide a signal;

c. pairs of pig-tail lines leading from said circuit housing for

connection to rails including a pair of lead and a pair of lag lines;

d. a filter circuit (45) including a battery coupling connected to said pig-tail lines;

e. a logic circuit (47) coupled to said filter circuit (45) including logic means to ascertain the presence and direction of a train in the lead and lag directions, said logic circuit having output side (73); and,

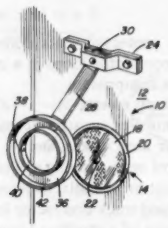
f. a timer circuit coupled between said logic circuit and said bulbs including an enabling relay, said timer circuit providing a blinking signal to said bulbs.

4,108,406

RAIL CAR SAFETY REFLECTOR

David M. Williams, 501 W. Third St., Apt. 708, Davenport, Iowa 52801

Filed Jan. 16, 1978, Ser. No. 869,623
Int. Cl.[2] B61L 5/18
U.S. Cl. 246—474 **8 Claims**



1. A passive visual warning device adapted to be mounted to a surface, comprising:

means mounted on the surface for directing light therefrom;

an arm member;

bracket means mounted on the surface in surmounting relation to the first-mentioned means for mounting the arm member at one end thereof for swinging movement relative to the first-mentioned means;

a cover member mounted on a free end of the arm member and disposed in superimposed relation to the first-mentioned means, the cover member at least partially occluding the first-mentioned means in at least certain positions relative thereto during swinging movement of the arm member and thus the cover member relative to said first-mentioned means; and,

means mounted on the cover member for catching air currents to cause the arm member and the cover member to swing relative to the first-mentioned means.

4,108,407

ADJUSTMENT DEVICE

Walter Lester Cable, Freehold; Derek Sidney Binge, Hamilton Square, and Rudolph Francis Korosec, Manville, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 14, 1975, Ser. No. 595,806
Int. Cl.[2] F16F 5/00
U.S. Cl. 248—23 **12 Claims**

1. An adjustment apparatus comprising:

a first member,

a second member, and

a plurality of adjustment devices secured in spaced relationship to said first and second members for orienting said first member with respect to said second member and providing the sole support between said first and second members,

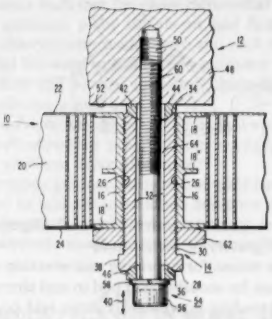
each said adjustment devices comprising,

a body having a first concave spherical seat disposed on one surface thereof and a second concave spherical seat disposed on a second surface thereof on a side opposite said one surface,

means coupled to said body for moveably securing said body to said first member so that said body translates in a first direction with respect to said first member,

a first support means having a spherical seat complementing and contiguous with said first spherical seat,

a second support means having a spherical seat complementing and contiguous with said second spherical seat, and



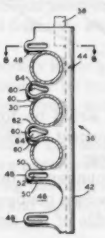
securing means extending through and spaced from said body and from each of said support means and in engagement with said second member for securing each of said support means and said body to said second member and for clamping said first and second support means to said body, whereby said second member is oriented with respect to said first member when said body is translated in said first direction without substantial stresses in said devices and members.

4,108,408

LOOPED TUBE CLAMP SUPPORT

James Paul Butti, Wadsworth, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jun. 3, 1975, Ser. No. 583,330
Int. Cl.[2] F16L 3/22
U.S. Cl. 248—68 R **4 Claims**

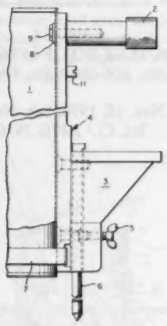


1. A spacer and support device for a heat exchanger having tube portions extending substantically parallel to each other, the device comprising a section formed with recesses to support and space the tube portions and with tabs disposed intermediate the recesses, each tab being formed with an enclosed aperture configuration, the enclosed aperture of each tab being slot like when its corresponding tube portions are set in place in corresponding recesses and adapted to be forcibly deformed to clamp its corresponding tube portions in place while maintaining the enclosed configuration of the aperture.

4,108,409
GOLF BAG ACCESSORY

Joseph Xavier Rombach, 5364 Plover La., Cincinnati, Ohio 45238, and James Hubert Lambert, 3705 Susanna Dr., Cincinnati, Ohio 45239

Filed Apr. 14, 1977, Ser. No. 787,546
Int. Cl.² A63B *55/00*
U.S. Cl. 248—96 **10 Claims**



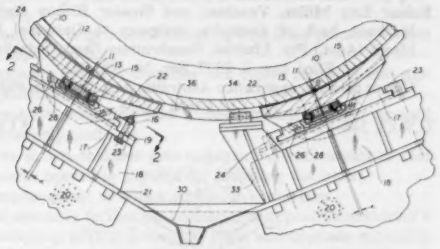
1. Device, for affixing to a golf bag, comprising:
(a) a rigid, flat, longitudinal side strip of a length not substantially exceeding the length of the golf bag and having an upper end and a lower end, the ends being designated in relation to the upper and lower ends of the golf bag;
(b) a rigid grip handle adapted at one end to receive a pin extending through an aperture in the upper end of the side strip, said pin firmly positioning the grip handle against the side strip;
(c) a rigid press step having a plurality of surfaces forming the top, bottom, front, back and sides of the press step, having substantially the same width as the side strip, having a top to bottom longitudinally extending aperture and a second aperture extending from the front of the press step at a right angle to and intersecting the longitudinal aperture, and adapted to receive a plurality of pins extending through a plurality of apertures in the lower end of the side strip, said pins firmly positioning the press step, at the back, against the side strip, the top of the press step being suitably adapted for being contacted with the bottom of a golfer's shoe;
(d) a rigid holding rod slidably housed in the longitudinal aperture in the press step and pointably adapted at one end for easy penetration into the ground;
(e) a pin movably housed in the second aperture of the press step and adapted to fixedly engage the holding rod;
(f) means for affixing the lower end of the side strip to the golf bag; and
(g) a stop pin at the upper end of the side strip to prevent upward loss of the holding rod from the longitudinal aperture in the press step.

4,108,410
SUPPORT DEVICE FOR A CYLINDRICAL ROTARY MEMBER

Alain Chielens, Marcq-en-Baroeul; Gérard Marchal, Hellemmes, and Michel Gesquiere, Lille, all of France, assignors to Fives-Cail Babcock, Paris, France

Filed Apr. 11, 1977, Ser. No. 786,280
Int. Cl.² F16C *13/06*
U.S. Cl. 248—130 **11 Claims**

1. A support device for glidably supporting a cylindrical member of large diameter arranged on the support device for rotation about an axis of the member and having a circumferentially extending, circular face portion, comprising
(a) a support having a support surface in gliding contact with the circular face portion to support the cylindrical member, two sides of the support surface extending in the circumferential direction of the circular face portion and defining the length of the support,
(b) a two-part ball-and-socket joint supporting the support for universal movement,
(c) a base supporting the joint, one of the joint parts being affixed to the support and the other joint part being affixed to the base, and

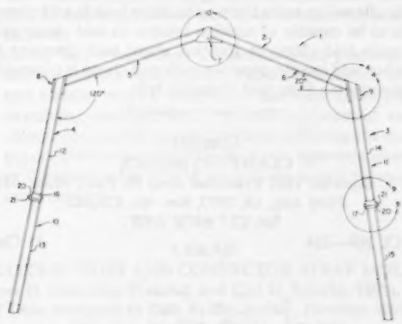


(d) a cheek plate integral with the support and extending from each of the support sides, the cheek plates enclosing the joint and a portion of the base whereby lateral movement of the support is restrained, and the cheek plates being configurated to stiffen the support and adapt the rigidity of the support to that of the circular face portion.

4,108,411
PORTABLE, COLLAPSIBLE HOISTING AND SUPPORTING APPARATUS

Eugene M. Spratt, 2057 Olive Ave., and Robert C. Dominguez, 38675 Paseo Padre Pkwy., #225, both of Fremont, Calif. 94538

Filed Mar. 22, 1977, Ser. No. 780,164
Int. Cl.² F16M *11/32*
U.S. Cl. 248—165 **8 Claims**



7. A portable hoisting apparatus comprising:
an arch-shaped cross member;
hinge means intermediate the ends of the arch-shaped cross member for folding the cross member;
means for attaching hoisting tackle to the cross member;
a first and a second supporting assembly each comprising a first and a second leg member for supporting the ends of the cross member;
means located at the ends of the cross member and at the top of the first and the second leg members in each of the supporting assemblies for slidably interconnecting the cross member and the supporting assemblies;
means for pivotably coupling one end of each of the first and the second leg members together for closing and spreading the first and the second leg members together and

apart, each of said leg members comprising a first and a second leg section; and

means located intermediate the first and the second leg sections for folding and unfolding the leg sections to reduce the space required for storing the hoisting apparatus when the apparatus is disassembled for storage.

4,108,412

CLAMP FOR TRIPOD DEVICE

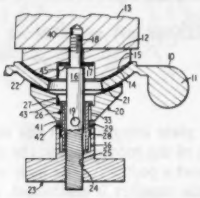
Robert Eric Miller, Vaucluse, and Stanley Bishop Jackson, Harbord, both of Australia, assignors to Universal Fluid Heads (Aust.) Pty. Limited, Ruschcutters Bay, Australia

Filed Aug. 4, 1977, Ser. No. 821,961

Claims priority, application Australia, Aug. 11, 1976, 6957/76

Int. Cl.² F16M *11/14*

U.S. Cl. 248—181 **5 Claims**



1. Apparatus for clamping a camera tripod top to a mounting platform for a camera head, said tripod top having a body member with an upper socket and the mounting platform having a mating convex under surface, said apparatus comprising:

a clamping bolt having an upper portion secured within the mounting platform and a lower threaded portion;

a clamp surrounding said clamping bolt adapted to clamp the mounting platform to the tripod top; and

a handle having a screw threaded small bore adapted to mate with the lower threaded portion of said clamping bolt and a larger bore shaped to accommodate a retaining sleeve, said retaining sleeve being adapted to rotate with said handle and to extend into a clearance bore in said clamp so as to be capable of rotation relative to said clamp but to retain said clamp in location about said clamping bolt when said handle, together with said clamp is removed by unscrewing from said clamping bolt.

4,108,413

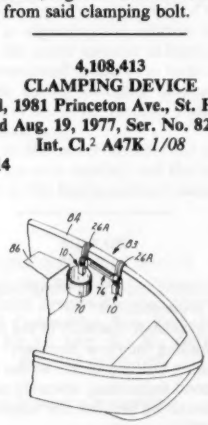
CLAMPING DEVICE

Dean L. Goserud, 1981 Princeton Ave., St. Paul, Minn. 55105

Filed Aug. 19, 1977, Ser. No. 826,042

Int. Cl.² A47K *1/08*

U.S. Cl. 248—214 **11 Claims**



9. A clamping assembly comprising a pair of clamps and an interconnecting bar, each of said clamps comprising a pair of elongated nesting channel shaped elements comprising side flanges interconnected by a web actuating means joining the channel elements of each pair of one another to move said elements toward and away from their nesting relation with one another to receive, grip and release an object to be clamped between the opposing edges of the side flanges of each element, said actuating means attaching each clamp to one end of said interconnecting bar, said bar having a flange at each end thereof abutting the side wall of each clamp, the upper portion of one of the clamping elements of each clamp extending above said interconnecting bar and comprising means to suspend said assembly from a support.

4,108,414

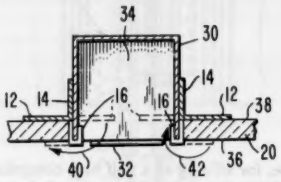
OUTLET BOX FASTENER

Everett A. Grant, Sr., 116 Shaft St., Glace Bay, Nova Scotia, Canada

Filed Nov. 15, 1976, Ser. No. 741,663

Int. Cl.² A47G *29/02*

U.S. Cl. 248—300 **2 Claims**



1. Apparatus for securing an electrical outlet in an opening of a wall member, comprising:

(a) an outlet box having two parallel sidewalls, an upper surface, a lower surface, a first flange extending generally vertically upward from said upper surface, and a second flange extending generally vertically downward from said lower surface, said outlet box positioned within said wall member opening with said flanges flush against the exterior surface of said wall member;

(b) a pair of fastener members, one fastener member adjacent each sidewall of said outlet box, each fastener member consisting of:

(1) a substantially planar first surface member positioned flush against the interior surface of said wall member;

(2) a substantially planar second surface member extending from and generally perpendicular to said first surface member, extending interiorly of said wall member and flush against the adjacent sidewall of said outlet box; and

(3) two finger members extending from said first surface member, through said opening to the exterior of said wall member, and over the adjacent sidewall of said outlet box into the interior thereof.

4,108,415

ROCKER SUSPENSION SYSTEM

Guy J. L. Hauray, Granby, and William E. Chapdelaine, Chicopee, both of Mass., assignors to Guyray Industries, Inc. (Entire), South Hadley, Mass.

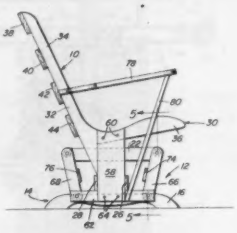
Filed May 11, 1977, Ser. No. 796,022

Int. Cl.² A45D *19/04*

U.S. Cl. 248—370 **9 Claims**

1. A suspension assembly including a base defining upstanding opposite side uprights adapted at their lower ends for stationary support from a horizontal surface, the upper end portion of each of said uprights including an elongated generally horizontal front to rear extending and projecting support head supported therefrom, each of said heads including a pair of elongated front and rear generally vertical support links whose upper end portions are pivotally supported from the front and rear end portions, respectively, of the corresponding head for oscillation about axes extending transversely of said

links and heads, said pairs of links being disposed on the remote sides of said heads and uprights, an upper support structure disposed above said heads and including opposite side portions, said opposite side portions including depending support members supported at their upper end portions from said opposite side portions and disposed outwardly of the remote sides of said uprights and links, the lower end portions of said support members each including front and rear anchor points spaced forward and rearward, respectively, of a vertical transverse plane spaced equally between said axes, the lower end portions of said pairs of links being pivotally anchored to the corresponding anchor points of said support member lower end portions for oscillation relative thereto about axes generally



paralleling the first mentioned axes and with said pairs of links spaced inwardly of the opposing sides of said support members and the corresponding anchor points, the approximate vertical midportions of the front and rear pairs of links each including a horizontal transverse brace extending and rigidly secured therebetween, the front brace extending between the front pair of links being lapped over the rear sides of the front links and the rear brace extending between the rear pair of links being lapped over the front sides of the rear links, and the opposite end portions of said front and rear braces being engageable with the underside portions of the front and rear extending portions, respectively, of said heads to limit rearward and forward swinging of said front and rear links, respectively.

4,108,416

DEVICE FOR ADJUSTING LENGTH OF GAS SPRING

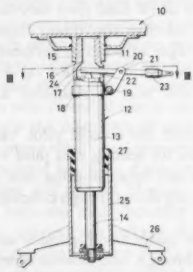
Toshiro Nagase, Sagamihara, and Susumu Hatakeyama, Yokohama, both of Japan, assignors to Tokico Ltd, Kawasaki, Japan

Filed Sep. 9, 1976, Ser. No. 721,820

Claims priority, application Japan, Sep. 17, 1975, 50-127793[U]

Int. Cl.[2] A47C *3/22*

U.S. Cl. 248—400 **1 Claim**



1. In apparatus for coupling a force-receiving seat member in adjustably spaced relationship to a support device and of the kind including

an elongate, adjustable length, fluid spring assembly having a cylinder body portion, fluid displacement chamber means within said body portion, a piston reciprocable within said body portion in operably coupled relationship with said fluid displacement chamber means and provided with a piston rod extending from the extremity of said body portion adjacent one end of said assembly, and a length-adjusting valve operably coupled with said fluid displacement chamber means for controlling the fluid therein to define a selected positioning for said piston and provided with a reciprocable valve operating element extending from the opposite extremity of said body portion;

means for reciprocably mounting said body portion on said support device;

means for operably coupling said piston rod with said support device;

means for mounting said force-receiving member on said assembly; and

lever means shiftable into engagement with a part of said valve operating element for actuating the latter;

the improvement of which apparatus comprises:

said assembly further has adjacent the opposite end thereof a coupling portion extending from said opposite extremity of said body portion beyond said valve operating element and serving as said mounting means for said member;

said coupling portion is provided with a cavity therein for receiving the engageable part of said valve operating element and with a lateral lever-clearing opening communicating with said cavity;

there is provided bracket means including a clamping portion for embracing said body portion of said assembly, a riser portion extending from said clamping portion into externally spaced relationship to said opening for pivotally carrying said lever means and means for pivotally mounting said lever means on said riser portion; and

there is provided means for tightening said clamping portion in a selected position on said body portion to mount said bracket means solely on said body portion of said assembly in spaced relationship to said member for supporting said lever means on said assembly in properly positioned operative relationship with said valve operating element and without physical engagement or mechanical connection of said bracket and said lever means with said seat member,

whereby said lever means are mounted and positioned on said assembly independently of said seat member, so that said member may be mounted on said assembly in manner permitting emplacement, removal, replacement or exchange for another member without affecting the mounting and positioning of said lever means upon said assembly or the relationship of said lever means to said valve operating element.

4,108,417

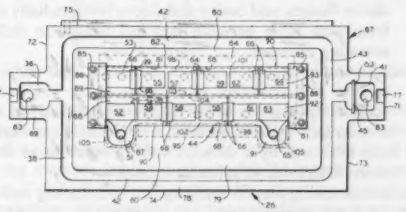
BATTERY POST AND CONNECTOR STRAP MOLD

Robert D. Simonton, Fremont, and Carl D. Schultz, Tiffin, both of Ohio, assignors to Dale Products, Inc., Fremont, Ohio

Filed Jul. 30, 1975, Ser. No. 600,203

Int. Cl.[2] B22D *27/04, 23/04, 25/04, 35/04*

U.S. Cl. 249—81 **14 Claims**



1. A mold assembly for casting elements onto storage battery

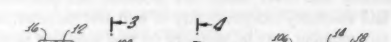
plates comprising a base having a contoured upper surface including a generally horizontal flow channel having an inlet and an outlet spaced apart along the length of said channel for guiding the flow of molten metal along essentially the entire length of said channel between said inlet and outlet, a perimeter wall contiguous to portions of said flow channel of a first height sufficient to constrain molten metal under normal operating conditions of said assembly, a runoff surface contiguous to portions of said flow channel having a second height less said first height whereby the assembly is adapted to pass metal over said runoff surface when the level of molten metal in said channel is raised above said second height and below said first height under normal operating conditions of said assembly, said base being free of mold cavities in which elements are cast; an insert having at least a portion of each of a plurality of mold cavities in its upper surface and adapted to be mounted adjacent said base and separable therefrom, said mold cavities for the elements to be cast being entirely contained upon said insert; means mounting said insert contiguous with said runoff surface; said insert having a contoured upper surface in molten metal flow communication with said runoff surface and being in molten metal tight mating relationship thereto; a heat flow barrier means between said base and said insert; said base having a large thermal mass whereby molten metal flowing in said flow channel is maintained molten; said insert having a small thermal mass relative to that of said base in the portion thereof defining walls of the mold cavities; and a coolant jacket integral with said insert and extending over a majority of the underside of said upper surface upon which said mold cavities are contained whereby molten metal in said cavities can be solidified by admission of coolant to said insert jacket without cooling said base to a degree impeding the flow of molten metal in said flow channel.

4,108,418

FLUID OPERATED PINCH VALVE

Harold W. Ensign, Fullerton, and Clifford V. Zieg, Costa Mesa, both of Calif., assignors to Cla-Val Co., Costa Mesa, Calif.

Filed Jan. 19, 1977, Ser. No. 760,816
Int. Cl.[2] F16K 7/07
U.S. Cl. 251—5 **22 Claims**



1. A fluid operated pinch valve comprising

a tubular casing having a flow axis and having connecting end flanges for connecting the casing in a flow line,

a flexible tubular sleeve in said casing and having end sealing sleeve flanges, said casing and sleeve being radially spaced from each other between said end flanges to define an actuating chamber,

said casing including means for admitting fluid under pressure to said chamber, said casing being longitudinally divided for less than its full length to provide a first casing section having an opening spaced radially outwardly of said flow axis by a distance at least equal to an exterior radial dimension of said sleeve, and

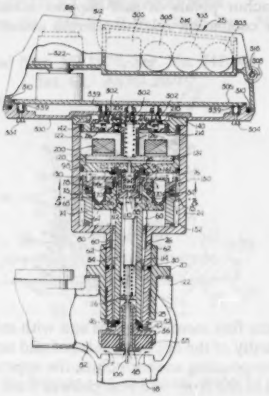
a second casing section bridging and overlapping said opening both longitudinally and transversely (bridging said opening) to seal said casing sections to each other and to said sleeve flanges.

4,108,419

PILOT OPERATED VALVE

Oded E. Sturman, and Benjamin Grill, both of Northridge, Calif., assignors to Clifton J. Burwell, Northridge, Calif.

Filed Mar. 1, 1976, Ser. No. 662,360
Int. Cl. F16k 31/02, 31/08
U.S. Cl. 251—30 **14 Claims**



1. A valve comprising:

a housing means having a lower housing for coupling to a valve body, and an upper housing,

a valve actuating means slideably extending into said lower portion of said valve body for motion between upper and lower positions and for defining a flow passage from said upper housing downward between said lower housing and said valve actuating means;

a valve closure means coupled to the lower portions of said valve actuating means for engaging a valve seat on a valve body when said valve actuating means in in said lower position;

a diaphragm within said upper housing coupled to said valve actuating means;

a diaphragm support member in said upper housing and supporting the outer periphery of said diaphragm, said diaphragm support member and said upper housing cooperating so as to allow fluid flow therebetween;

a pilot valve seat member above said diaphragm and mating with the diaphragm adjacent its periphery to define a fluid chamber therebetween, said pilot valve seat member having a pilot valve seat surrounding an opening therethrough;

a separator member above said pilot valve seat member, including means for sealing said pilot valve seat member with respect to said upper housing, said separator member having an opening therethrough concentric with said pilot valve seat;

a flexible member under said separator member to seal said opening therethrough, said flexible member being deflectable between a position against said pilot valve seat and a position spaced away from said pilot valve seat, said separator member and said pilot valve seat member having facingly disposed cooperative surfaces to define a flow passage therebetween; and

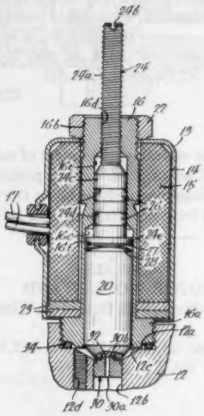
a pilot valve actuating member extending through said opening in said separator member to control the position of said flexible member.

4,108,420

ADJUSTABLE GAS FLOW CONTROL VALVE

Ernest James West, San Jose, and Gary M. Brandenburg, San Carlos, both of Calif., assignors to Thermco Products Corporation, Orange, Calif.

Filed Mar. 21, 1977, Ser. No. 779,611
Int. Cl.[2] F16K 31/06
U.S. Cl. 251—129 3 Claims



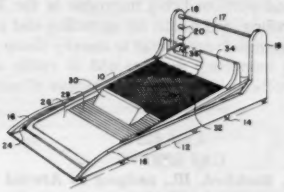
1. A gas flow control valve comprising a base member having a pocket formed to receive a portion of a valve mechanism, said mechanism including a plunger mounted for reciprocation within an elongated sleeve, said sleeve having a bore extending longitudinally therethrough, a first portion of said bore extending from one end of said sleeve being of a diameter to slidably support said plunger and terminating at an annular shoulder, a second portion of said bore extending from said other end of said sleeve and having internal threads formed therein, an elongated stop member having a threaded portion which threadedly engages said second portion of said sleeve bore and having an abutment portion extending into said first portion of said bore, said stop member comprising a piston having a threaded shank received in said second portion of said sleeve, said shank having a portion accessible outside of said sleeve to permit rotation of said piston to translate said plunger longitudinally of said sleeve, said piston being formed with a circular plate forming said abutment portion on the end within said first portion of said sleeve bore, an intermediate portion on said piston between said threaded shank, said plate being of a diameter intermediate the diameters of said plate and of said shank, said bore having a third portion extending between said first and second portions having a diameter intermediate the diameters of said first and second portions, gasket means on said stop member between said abutment portion and said threaded portion to prevent gas leakage through said sleeve, said gasket means comprising at least one O-ring received in an annular channel in said intermediate portion of said piston, said O-ring being compressed in said sleeve against said third portion of said bore, spring means between said plunger and said abutment means, an electrical coil surrounding said sleeve to create an electromagnetic field to move said plunger longitudinally in opposition to said spring means, said base member having a valve seat which is engaged by said plunger to cut off gas flow when said coil is deenergized.

4,108,421

LEVELING UNIT FOR PARKED VEHICLES

James M. Extine, Roseville, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Dec. 7, 1977, Ser. No. 858,258
Int. Cl.[2] E02C 3/00
U.S. Cl. 254—88 4 Claims



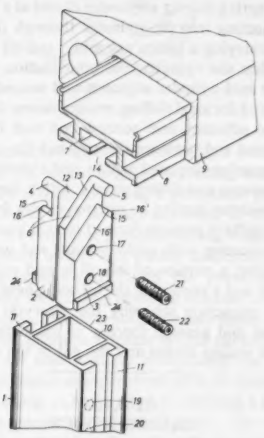
1. A leveling unit for parked vehicles comprising a generally horizontal stand having a vertical front end; ground-engaging means under said stand; a vertically adjustable tire-supporting ramp mounted on said stand; a plurality of spaced fastening means on said front end cooperating with means integral with the front end of said ramp for securing said ramp at a desired angle to said stand; curved, tire-hugging means near said front of said ramp for engaging one side of a vehicle tire and a wedge means for engaging the other side of said tire to prevent movement thereof.

4,108,422

ARRANGEMENT FOR SUPPORTING A RAILING AND THE LIKE

Horst Fleischmann, Munich, Fed. Rep. of Germany, assignor to Gebrüder Kömmerling Kunststoffwerke GmbH, Pirmasens, Fed. Rep. of Germany

Filed Apr. 22, 1977, Ser. No. 790,139
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618443
Int. Cl.[2] F16B 7/04
U.S. Cl. 256—67 12 Claims



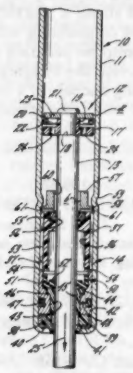
1. An arrangement for supporting an elongated railing or the like which is provided with a longitudinal T-shaped groove and a slot communicating with said groove, comprising a supporting member having a longitudinally extending inner hollow; a T-shaped clamping element including two clamping members located adjacent one another, said clamping members each having a longitudinally extending first portion and a transversely extending pin-shaped second portion having an

axis, the axis of one of said pin-shaped second portions being substantially parallel to but offset relative to the axis of the other pin-shaped second portion in a direction transverse to said axes thereof and to the elongation of said first portions, said first portions of said clamping elements being insertable in said hollow of said supporting member and movable relative to each other in the direction of elongation of said hollow, said pin-shaped second portions being insertable in the T-shaped groove of said railing; and means for spreading said clamping members apart from each other so as to thereby clamp said first portions in said supporting member and to clamp said pin-shaped second portions in the T-shaped groove of said railing.

4,108,423
GAS SPRING

John J. Skubal, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Jul. 19, 1976, Ser. No. 706,903
Int. Cl.[2] F16F *5/00*
U.S. Cl. 267—64 R **9 Claims**



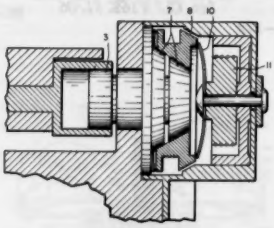
1. In a gas spring having a cylinder closed at a first end, a rod slidably projecting into the cylinder through the second end thereof and carrying a piston assembly, and oil and gas under pressure within the cylinder, the combination of, means disposed within said cylinder adjacent said second end and supporting said rod for axial sliding, sealing means disposed within said cylinder adjacent said second end and forming a seal around said rod and between the rod and the cylinder, and a cylindrical member disposed within said cylinder inwardly of said sealing means and fitting snugly within the cylinder, said cylindrical member having an internal cavity forming a reservoir and a capillary passage formed in said member, said passage communicating with said reservoir and with the interior of said cylinder, a portion of the oil in said cylinder being in said reservoir and a portion of the oil being held in said passage by capillary attraction whereby the reservoir is replenished with oil from said passage thereby to maintain a body of oil between said sealing means and the gas in the cylinder.

4,108,424
CAGING DEVICE

Anthony A. Rizzo, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 29, 1976, Ser. No. 671,197
Int. Cl.[2] F16F *1/18;* F16D *11/06*
U.S. Cl. 267—160 **5 Claims**

1. A caging device comprising:
a tubular shaft,
a shaft extending concentrically through said tubular shaft,
a support mounting said shafts for rotation relative to one another and to said support,
coaxial, axially spaced frusto-conical clutch surfaces on said shafts, respectively, having a common vertex,
a caging member including a conically tapered clutch surface coaxial with and of the same cone angle as said frusto-conical clutch surfaces, and

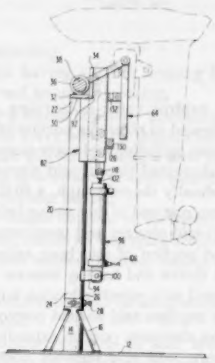


actuating means for effecting movement of said caging member to and from an engaged caging position, wherein its clutch surface simultaneously engages the clutch surfaces of said shafts to lock the shafts against relative rotation.

4,108,425
MOTOR WORK STAND

George Frederick Crabtree, P.O. Box 1135, Winter Garden, Fla. 32787

Filed Dec. 28, 1977, Ser. No. 865,349
Int. Cl.[2] B23Q *1/04*
U.S. Cl. 269—71 **4 Claims**



1. An outboard motor repair stand comprising:
a base with a vertically extending standard projecting therefrom;
a carrier tube slidably engaged on the standard and means to lock the carrier tube at selected height on the standard, the carrier tube having an upper end;
a bracket on the upper end of the tube, the bracket including a horizontal foot and a vertical leg;
a sleeve fixedly secured to the bracket;
an elongated horizontal rod mounted within the sleeve, and having first and second side portions projecting laterally from the sleeve;
an outer bearing assembly on the first side portion of the rod, and an inner bearing on the second side portion thereof;
a radial, outward arm on each of said bearing assemblies;
a motor mounting plate pivotally secured between the arms, and having mounting tabs on one face thereof;
a channel track assembly fixedly secured to the carrier tube and to the bracket adjacent the upper end of the tube;
a hydraulic pump mounted on the rod;
a hydraulic cylinder, including an extensible and retractable ram vertically mounted on the tube below and in align-

ment with the channel track assembly; hydraulic conduit means extending between and operatively associating the pump with the hydraulic cylinder; and

a trolley assembly having a lower end secured to the ram, an upper end lock section pivotally secured to said mounting tabs on said motor mounting plate, and a series of rollers engaging the channel track assembly.

4,108,426

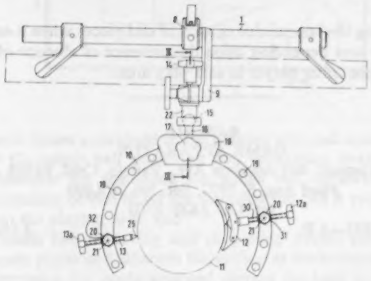
DEVICE FOR HOLDING THE HEAD OF A PATIENT

Harry Lindstroem, Solna, and Sverre Kvaerna, Farsta, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 26, 1978, Ser. No. 872,448

Int. Cl.[2] A61G *13/00*

U.S. Cl. 269—328 **10 Claims**



1. A device for holding a head of a patient in a fixed position during a surgical operation comprising a base support, a ring-like curved element having a sufficient radius of curvature to enable receiving the head of the patient within the element, means for supporting the ring-like curved element on the base support including a ball and socket joint having means for manually arresting the joint in any desired postion, a pad supported on a rod acting as a headrest, a pin support on a rod for holding a head in a fixed position on said pad, means for mounting the rod supporting said pad on the element and means for mounting the rod supporting the pin on the element, both of said means for mounting being adjustable to enable changing the length of the respective rods extending from the element to clamp the head of the patient between the pad and pin.

4,108,427

FEEDING DEVICE

Shigehiro Komori, Yokohama; Hiroyuki Hattori, Tokyo; Tsuneki Inuzuka, Machida, and Koichi Miyamoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 677,124, Apr. 15, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,861

Claims priority, application Japan, Apr. 18, 1975, 50-47250; May 6, 1975, 50-55076

Int. Cl.[2] B65H *1/28, 3/44*

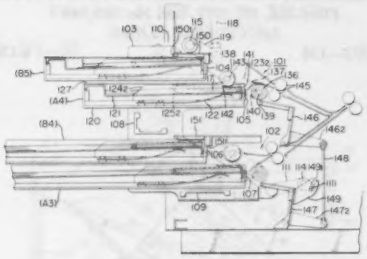
U.S. Cl. 271—9 **9 Claims**

1. A copy material feeding device, comprising:

a cassette unit provided with a plurality of cassettes each having a copy material feeding portion which is disposed out of vertical alignment with another cassette, wherein said cassettes are mounted on said cassette unit such that the relative distances between the feeding portions of said cassettes are constant at all times;

single feeding means for feeding copy material in a predetermined direction of movement from the feeding portion of a cassette positioned adjacent thereto; and

means for moving said cassette unit in the direction of movement of the copy material to position a selected one of said cassettes with its feeding portion adjacent to said feeding



means without moving any of said cassettes relative to said cassette unit.

4,108,428

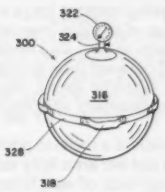
PORTABLE PUNCH POWER GAGE

Harold E. Winterbottom, 1702 Lansing Rd., Glen Burnie, Md. 21061

Filed Apr. 18, 1977, Ser. No. 738,225

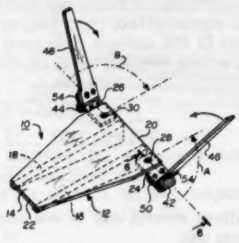
Int. Cl.[2] A63B *69/32*

U.S. Cl. 272—76 **1 Claim**



1. In boxing practice apparatus including a punching bag or the like, means for supporting the punching bag, means for indicating punch power, including a pneumatic pressure compartment associated with at least a portion of said punching bag in position for receiving punches during boxing practice, a pneumatic pressure meter, and means connecting said pneumatic pressure compartment with the pneumatic pressure meter for thereby forwarding pressure increase to and indicating punch power on the pneumatic pressure meter as a function of punch-induced pressure increase in said pneumatic pressure compartment, the improvement comprising: the means connecting said pneumatic compartment with the pneumatic pressure meter including a check valve for holding a said pressure increase in the pneumatic pressure meter, the check valve having manually actuable means for releasing pressure from the pneumatic pressure meter through the check valve into the punching bag for resetting the pneumatic pressure meter, the pneumatic pressure meter being located at the top central portion of the punching bag, the punching bag being spherical and the means for supporting including four strap handles equally spaced around the equator thereof located in position for alternatively holding the punching bag with the pneumatic pressure meter facing toward, or away from, or to either side of, a user during boxing practice.

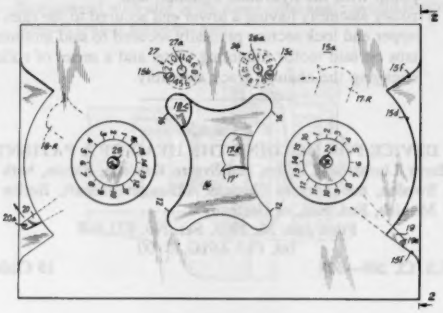
4,108,429
SPRING TYPE EXERCISE DEVICE FOR BREAST MEASUREMENT DEVELOPMENT
Thomas Minichiello, 244 W. 49th St., New York, N.Y. 10019
Filed Jan. 10, 1977, Ser. No. 758,069
Int. Cl.[2] A63B *21/04*
U.S. Cl. 272—136 **6 Claims**



1. A device for exercising female pectoral muscles to achieve breast measurement development, which comprises:
support base means for positioning the supine body of the exerciser so that said base support means accomodates the shoulders and upper back of the exerciser and is held in place on the floor by the weight of the exerciser;
a pair of rigid connecting members attached to the base means and extending outwardly beyond said base means;
pivot means for mounting said pair of connecting members each independently rotatable in a substantially horizontal plane on said support base means to selectively position the connecting members in a plurality of horizontal positions;
a pair of rigid exercise lever arms attached to said connecting members; and
a pair of yieldable spring resistant hinge means for connecting each of said pair of exercise lever arms to each of said connecting members so that said lever arms extend biasedly upward and outward from said support base means, each said pair of yieldable spring resistant hinge means being positioned substantially adjacent to one shoulder of the exerciser,
permitting the rxerciser, in a reclined position with her back on the base means and her arms fully extended, so as to be capable of grasping each of said lever arms, to pull inwardly toward the body's center as far as possible against the biasing force of said yieldabl spring resistant hinge means, then to allow said lever arms to return to their outwardly extending starting position under action of the hinge means, the body motions involved being produced by the full flexion and extension of the pectoral muscles substantially alone.

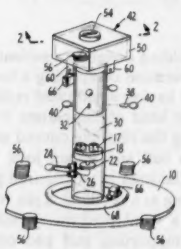
4,108,430
ACTION GAME
Morton P. Matthew, Litchfield, Conn., and Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y. 11320, assignors to Michael I. Rackman, New York, N.Y.
Filed Jul. 20, 1977, Ser. No. 817,199
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **17 Claims**

1. An action game for two players comprising a piece for each player; a pair of manually operated means associated with respective players for moving the respective pieces along respective paths; means for identifying a play area through which both of said pieces move, less than half of each respective path passing through said play area; a pair of means each for enabling a respective player to select a discrete number of positions through which his respective piece is moved responsive to the operation of the respective manually operated means, both of said enabling means allowing the selection of the same minimum number of positions and the same maximum number of positions, and each of said respective paths having the same number of discrete positions therealong; and means



for varying the appearance of each of said pieces when it enters said play area depending upon the presence of absence of the piece of the other player in said play area.

4,108,431
GAME APPARATUS
Manuel Camara, 600 Jennings Ave., Vallejo, Calif. 94590
Filed Aug. 8, 1977, Ser. No. 822,895
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **3 Claims**



1. Game apparatus comprising a support base, an upright, tubular carrier member mounted on the base, a platform disposed within said member and means mounting the same therein for two-way vertical movement, a pair of dice supported by said platform, means for impacting said platform to throw the dice thereon, said member having a transparent wall portion for the viewing of said dice, a collection box having a coin-slot entryway for chips and the like removably attached to the upper end of said member, a plurality of key-operated locks removably attached to said box and individually effective in the closed condition to prevent the opening of said box, and keys for said locks.

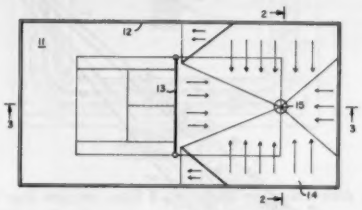
4,108,432
TENNIS BALL COLLECTION, PICK-UP AND PROPELLING SYSTEM
Thomas S. Clark, Monte Sereno; William S. Kennedy, San Jose, and Robert L. Piziali, Stanford, all of Calif., assignors to American Tennis Systems, Inc., Sunnyvale, Calif.
Division of Ser. No. 386,308, Aug. 7, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 641,081
Int. Cl.[2] A63B *69/00*
U.S. Cl. 273—29 A **3 Claims**

1. A tennis practice and instruction facility including a firm surfaced area laid out similar to a tennis court and including a tennis net dividing the area into a playing area

and a return area said playing area being formed on a level surface;

the return area surface being gradually sloped to a common point near the center of the area as measured between two sides such that the return area forms a shallow depression of sufficient slope to cause the balls to roll toward the common point;

a tennis ball retrieving and propelling device positioned in the depression at the common point of the return area including means for retrieving individual balls from the common point and means for propelling the balls across the tennis net and into the playing area;



control means positioned in the playing area and connected to the tennis ball retrieving and propelling device and adjustable for regulating the tennis ball retrieving and propelling device to set the direction the ball is propelled into the playing area; and

the tennis ball retrieving and propelling device including means positioned adjacent the surface at the bottom of the depression for contacting and stirring the balls to assure proper cueing of the tennis balls located in the depression and for moving them in serial fashion along a predetermined path for retrieval by the device.

4,108,433

TENNIS RACKET WITH WARM-UP WEIGHT

Bruce B. Althoff, 2602 Windwood Ct., Atlanta, Ga. 30360

Filed Feb. 14, 1977, Ser. No. 768,419
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **7 Claims**

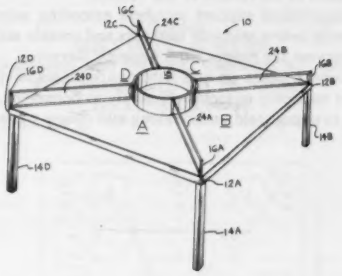
5. A racket having a warm-up device detachably mounted thereto and comprising a racket head having a generally oval shaped periphery, a racket handle mounted to said racket head at a racket throat, a one-piece, elongated, u-shaped, flexible member mounted flush about said oval periphery of said racket head with its ends positioned closely adjacent one another straddling said racket throat, and a flexible connector mounted around said racket throat and secured to said member ends thereby holding said ends snuggly to opposite sides of said racket throat and holding said oval shaped priphery between the legs of said u-shaped cross-section.

4,108,434

MULTI-NET TABLE TENNIS APPARATUS

George Ronald Royer, Toledo, Ohio, assignor to Robert L. Bratton, Swanton, Ohio, a part interest

Filed Mar. 8, 1977, Ser. No. 775,578
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—30 **2 Claims**



2. A game apparatus for a variation of table tennis comprising:

(a) a playing surface having outer peripheral limits;

(b) a hollow member with an opening located on the upper part thereof, said hollow member extending upwardly from said playing surface and being located in the center of the playing surface and having solid sides around its peripheral circumference for retaining insufficiently hit balls;

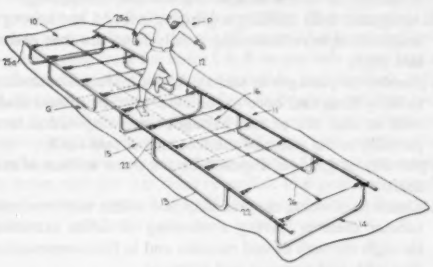
(c) four nets extending in radiating fashion from the hollow member to arbitrary points in the outer limits of the playing surface.

4,108,435

PORTABLE RUNWAY WITH LONGITUDINAL SUPPORTS AND TENSION HOLDING MEANS

James T. Coleman, P.O. Box 1341, Paducah, Ky. 42001

Filed Jul. 12, 1976, Ser. No. 704,523
Int. Cl.[2] A63B *67/00*
U.S. Cl. 273—55 R **6 Claims**



1. A portable runway for use by a runner to practice running along a course on a generally flat surface comprising,

an elongated framework including a plurality of opposed side members forming multiple sections,

means for detachably connecting said side members along each side to provide assembly of said sections,

cross members adapted to support said side members in a spaced relationship to each other and in spaced relationship to said flat surface,

separate longitudinal members adapted to support said side members in a spaced relationship to said flat surface,

said cross support members being of generally U-shaped configuration and extending across said running course only at said connection of said side members,

means connected to said framework and forming a latticework at a predetermined height above said surface and at predetermined spaced intervals to define spaces along said course in which the runner is to place his feet during use for high stepping running,

said running course being free of obstacles below said lattice work and between each of said cross members, to allow freedom of movement of the runner,

said longitudinal support members extending substantially directly below said side members and outside said course to prevent the runner from stepping thereon,

and resilient means on said latticework means having sufficient resiliency to yield sufficiently to permit the runner's feet to engage said surface along said course when stepped on.

4,108,436

AIRED GRIP FOR TENNIS RACKETS

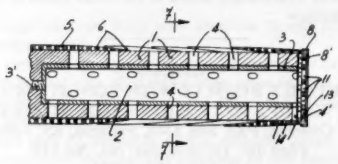
Lamberto Masi, 20016 Pero (Milan), Italy

Filed Dec. 9, 1976, Ser. No. 749,058

Claims priority, application Italy, Dec. 16, 1975, 30337 A/75; Mar. 3, 1976, 21071 A/76

Int. Cl.[2] A63B *49/08*

U.S. Cl. 273—75 **17 Claims**



1. A handle for tennis rackets and the like, comprising:

an elongated shaft defining a gripping portion and having a longitudinal bore extending axially from the free end of said shaft;

a plurality of passages in said shaft, said passages extending radially from said bore to the outer surface of said shaft, with at least one of said passages being disposed at least partially in the plane of the free end of said shaft;

a plurality of grooves disposed on the outer surface of said shaft;

a tubular reinforcing member disposed within said bore, said tubular member having a plurality of holes extending through the wall of said member and in fluid communication with said passages and grooves;

a cap attached to the free end of said shaft and having a sidewall extending over the free end portion of said shaft and an end wall disposed adjacent to said free end, said sidewall having a plurality of holes extending therethrough, and said end wall having a central aperture aligned with said bore; and

a ventilation chamber defined between the free end of said shaft and the adjacent inner surface of said end wall, and in fluid communication with said grooves and said holes in said sidewall,

said bore, passages, grooves, holes and ventilation chamber being in fluid communication and cooperating to form a plurality of fluid flow paths therethrough to ventilate said shaft.

4,108,437

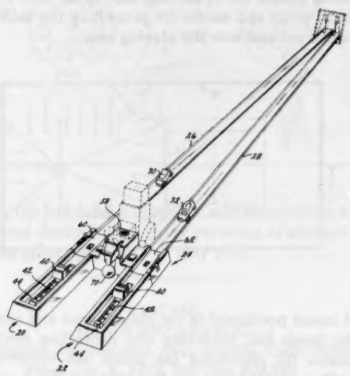
TOY VEHICLE STARTING AND LAUNCHING SET

Nicholas DeAnda, Redondo Beach; Robert F. Dyer, Rancho Palos Verdes, and Roger A. Newbold, Garden Grove, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 17, 1977, Ser. No. 759,633

Int. Cl.[2] A63B *9/14*

U.S. Cl. 273—86 D **8 Claims**



1. In a delayed action starting apparatus for use with toy racing cars or the like, the combination comprising:

a housing;

timer means coupled to said housing and operable under the force of gravity between upper and lower positions;

a spring-biased mechanism pivotally mounted within said housing;

latch means;

means on said timer means adapted to pivot said spring-biased mechanism against the force of its bias to engage said latch means upon movement of said timer means from said lower to said upper position, said means on said timer means being adapted to disengage said latch means upon said timer means reaching said lower position; and

other means mounted within said housing for emitting an audible signal in response to the pivoting of said mechanism under the force of its bias spring when released.

4,108,438

METHOD OF PLAYING A BOARD GAME

Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y. 11230

Filed Nov. 15, 1976, Ser. No. 733,473

Int. Cl.[2] A63F *7/00*

U.S. Cl. 273—120 R **20 Claims**

1. A method of playing a board game, said board game having the following parts:

(a) a board having a plurality of tracks with a plurality of interconnecting segments therebetween, and a plurality of identifiable positions along said tracks,

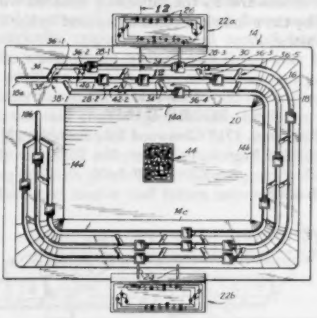
(b) a plurality of switching means adapted to be placed on the board in the regions of said interconnecting segments for defining an operative path from a start point to a finish point and including selected segments of said tracks and selected ones of said interconnecting segments, and

(c) at least two sets of player pieces having a plurality of respective scoring values operatively associated therewith, said pieces being selectively placed by at least two respective players on said identifiable positions, comprising the steps of

(a) the players taking turns and alternately placing their player pieces on selected ones of said identifiable positions, the player pieces then remaining in their respec-

tive selected positions throughout the performance of the subsequent steps,

(b) thereafter, the players taking turns and alternately placing switching means on the board in selected ones



of said regions until a complete operative path is defined, and

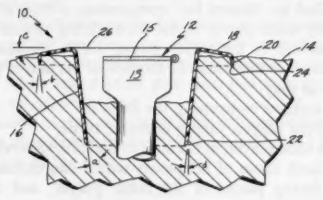
(c) thereafter, examining the scoring values associated with the player pieces which lie along the operative path defined in step (b).

4,108,439

SPRINKLER HEAD LOCATER AND MARKER AND METHOD

Murvail C. McGuire, 7820 Mackinaw Trail, Cadillac, Mich. 49601

Filed Apr. 14, 1976, Ser. No. 676,726
Int. Cl.[2] B05B *15/06*; A63B *69/36*
U.S. Cl. 273—176 R **12 Claims**



1. In combination, a device for marking the position of and for protecting a sprinkler valve or head and a sprinkler valve or head within the ground; said device comprising:

a single-piece, hollow member positioned around the valve or head and located in the ground, said hollow member having a tapering, inside surface spaced outwardly away from and surrounding the valve or head to provide an internal open space between said inside surface and the valve or head and which opens vertically around the valve or head, said inside surface tapering upwardly and outwardly from a lower end in the ground to an upper end spaced above said valve or head, the opening at said upper end being larger than the opening at said lower end and the valve or head;

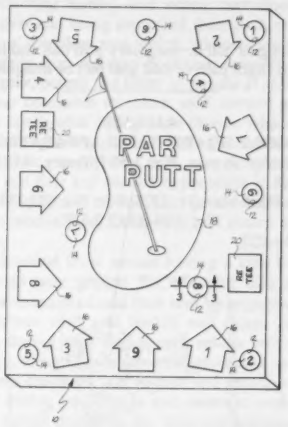
flange means adjacent the upper end of said member and extending outwardly from said upper end for contacting the ground to limit the depth of insertion of said member and to stabilize the orientation of said member in the ground and for deflecting equipment and vehicles up and over said valve or head; said flange means extending around said upper end of said member from a position flush with said inside surface of said hollow member at said upper end and downwardly from said position into contact with the ground; said internal open space between said inside surface and valve or head and said opening at said upper end providing sufficient room for operation of the object such as a sprinkler valve or head while preventing contamination of the object by dirt and debris.

4,108,440

GOLF PUTTING GAME

Delano Delaplaine, 2221 Park Rd., Charlotte, N.C. 28203

Filed Jul. 25, 1977, Ser. No. 818,421
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 E **5 Claims**



1. A golf putting game comprising a mat of substantial thickness and size in plan formed of foamed resilient material, nine holes cut through said mat of putting cup size and located at selected positions in said mat that allow unobstructed lines of approach from locations along the respective edges of said mat, slices of said foamed material fitting said holes and disposed at the bottom thereof, said foamed material slices bearing indicia of **1** to **9** on one side and **10** to **18** on the other side, indicia markers located around the edges of said mat indicating regular teeing areas for holes **1** to **9** on one side of the mat and for holes **10** to **19** on the other mat side, two auxilarly indicia markers at respective mat edges indicating penalty teeing areas, said regular teeing areas being located for unobstructed approach to the correspondingly indicated hole, a selected one of said penalty teeing areas being located for such approach to the holes, and said mat being reversible to expose holes marked **1** to **9** or holes marked **10** to **18** upon pressing said slices to the bottom of said holes upon each reversal.

4,108,441

GOLF SWING TRAINING APPARATUS AND METHOD

Wynn B. Tredway, Sr., P.O. Box 130, Freeport, Pa. 16229

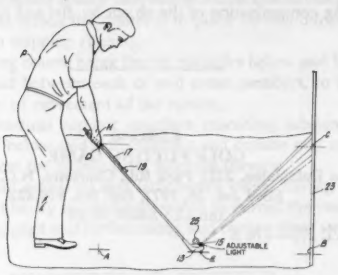
Filed Feb. 3, 1977, Ser. No. 767,285
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 A **3 Claims**

1. The combination comprising:

(a) a training golf club having a head portion; and

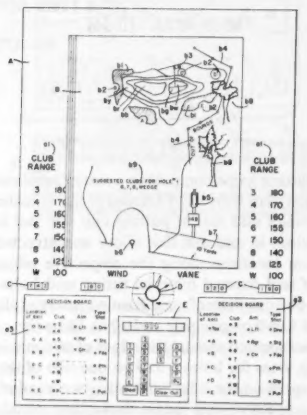
(b) a light adjustably mounted to said head portion in such a way that, when said traning golf club is held at a proper position at the top of the backswing by a golf pupil ad-

dressing a golf ball or an imaginary golf ball, a beam of light from said light shines along a line extending away



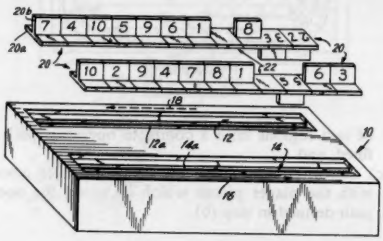
from said golf ball or imaginary golf ball and normal to the intended flight path of said golf ball or imaginary golf ball.

4,108,442
GOLF BOARD GAME APPARATUS
Holland Eldridge Bynam, Hq. 2-36 Infantry, APO New York, N.Y. 09045
Filed Mar. 31, 1976, Ser. No. 672,234
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—237 **4 Claims**



1. An indoor golf game apparatus comprising:
(a) a game board having indicia marked thereon relating to golf;
(b) a plurality of hole layout boards, each having a distinctive representation of a golfing hole layout marked thereon;
(c) a wind direction chance means located on said game board for randomly selecting one of several indicia representing various wind directions or no wind direction;
(d) at least one decision board means located on the game board for marking and recording four types of data selections comprising the location of the ball on the hole layout and the player's selections of the type of club, the direction of aim of the shot, and the type of shot he will make in view of the randomly selected wind condition derived by said wind direction chance means;
(e) a calculator means for receiving input of one each of the four types of data relating to the ball location and the player's selections of the type of club, the direction of aim of the shot, and the type of shot he will make in view of the randomly selected wind condition, said calculator means further comprising means for computing and visually displaying a numerical value uniquely based upon the combination of the four input data entered therein; and
(f) a plurality of shot-value card means for determining the location of the ball after each shot on the hole layouts as determined by the numerical value computed by the calculator means and by the randomly selected wind condition or by the numerical value computed by the calculator means alone.

4,108,443
BOARD GAME
Michael I. Rackman, 1710 Glenwood Rd., Brooklyn, N.Y. 11230
Filed Mar. 4, 1977, Ser. No. 774,245
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—243 **36 Claims**



1. A method for playing a board game, said board game having a board; two sets of player pieces, each of the pieces of each player containing a marking thereon indicative of pieces of the other player which it can capture and pieces of the other player by which it can be captured, said board having two parallel means for linearly positioning respective sets of said player pieces facing each other and facilitating the changing of the relative positions of the player pieces in each set; and means controlled by chance for representing a type of move to be taken by each player in his turn during which such player removes one of his player pieces which remain in play and re-positions it elsewhere in the line of his player pieces which remain in play;
said method comprising the steps of:
(a) the players taking alternate turns,
(b) each player, at the start of his turn, removing from play both those of his pieces which can capture respective facing pieces of the other player, and the captured pieces, and
(c) each player, at the end of his turn, making a move of the type represented by said chance-controlled means.

4,108,444
PHONOGRAPH RECORD PLAYER
Kazuyuki Takizawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 9, 1976, Ser. No. 740,319
Claims priority, application Japan, Nov. 10, 1975, 50-135989
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—9 R **13 Claims**

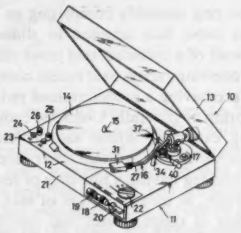
1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lateral swinging movement across said turntable and for raising and lowering of the tone arm relative to said turntable: a control mechanism for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of said stylus on a record supported by said turntable so as to commence a play operation, and for effecting a return movement of said tone arm to said rest posi-

tion upon the termination of said play operation, said control mechanism comprising

a drive gear rotatable by said drive means;

a rotatable control gear having first and second sets of peripheral teeth engageable by said drive gear for respectively effecting lead-in and return movements of said control gear and being separated from each other by diametrically opposed first and second toothless gaps which, when facing toward said drive gear in stop and play positions, respectively, of said control gear, permit the latter to remain at rest while said drive gear continues to rotate, said control gear further having a continuous cam groove therein;

pivotally mounted lever means having a cam follower engaging said cam groove so as to be angularly displaced for effecting said lead-in and return movements of said tone



arm during said lead-in and return movements, respectively, of said control gear;

individual lead-in and return clutch means mounted on said control gear at diametrically opposed locations, said lead-in and return clutch means having disengaged positions and engaged positions in which said lead-in and return clutch means are respectively operative for initiating movements of said control gear from said stop and play positions thereof;

a single actuating slide movable from an inoperative position to an operative position for selectively actuating said lead-in and return clutch means to the respective engaged positions when said control gear is in said stop and play positions, respectively; and

electromagnetic means associated with said actuating slide and being energizable for moving the latter to said operative position of the slide.

4,108,445

PHONOGRAPH RECORD PLAYER

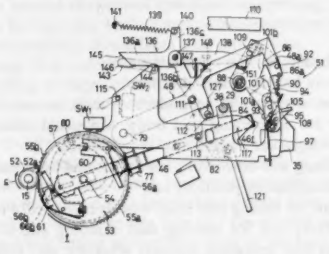
Kazuyuki Takizawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,358

Claims priority, application Japan, Nov. 10, 1975, 50-135989

Int. Cl.[2] G11B *17/06*

U.S. Cl. 274—9 R **9 Claims**



1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lateral swinging movement across said turntable and for raising and lowering of the tone arm relative to said turntable: a control mechanism for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of said stylus on a record supported by said turntable so as to commence a play operation, and for effecting a return movement of said tone arm to said rest position upon the termination of said play operation, said control mechanism comprising

a drive gear rotatable by said drive means;

a rotatable control gear having first and second sets of peripheral teeth engageable by said drive gear for respectively effecting lead-in and return movements of said control gear and being separated from each other by first and second toothless gaps which, when facing toward said drive gear in stop and play positions, respectively, of said control gear, permit the latter to remain at rest while said drive gear continues to rotate, said control gear further having a continuous cam groove therein which includes a lead-in cam groove portion having connections, at its opposite ends, to adjacent ends of a return cam groove portion, and first and second depressions in opposite side walls, respectively, of said cam groove at said connections, respectively, of the lead-in and return cam groove portions;

pivotally mounted lever means having a cam follower engaging said cam groove for effecting said lead-in and return movements of said tone arm by engagement of said cam follower with said lead-in and return cam groove portions during said lead-in and return movements, respectively, of said control gear wherein said cam follower completely traverses said lead-in and return cam groove portions during said lead-in and return movements;

propelling means operative for initiating movement of said control gear from each of said stop and play positions thereof; and

control gear holding means acting on said lever means to urge said cam follower in one direction into said first depression with said control gear in said stop position and in the opposite direction into said second depression with said control gear in said play position, whereby to hold said control gear against inadvertent movement from each of said stop and play positions in the absence of operation of said propelling means.

4,108,446

PIPE COUPLING SOCKET ASSEMBLIES

Peter Frederick Victor Lloyd, 4, Mynchen End, Beaconsfield, Buckinghamshire, HP9 2AT, England

Filed Dec. 10, 1975, Ser. No. 639,343

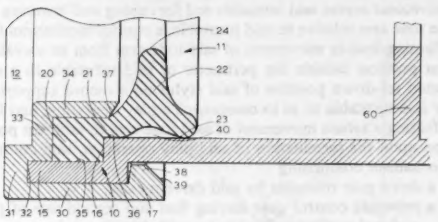
Claims priority, application United Kingdom, Sep. 2, 1975, 36105/75

Int. Cl.[2] F16J *15/10*

U.S. Cl. 277—101 **13 Claims**

1. A pipe coupling socket assembly comprising a socket having an outer surface and an inner surface and a mouth, a sealing ring positionable within said socket, a locking ring for locking said sealing ring in position, means for securing said locking ring to said socket, said locking ring being of channel section and comprising an outer flange extending adjacent said outer surface of the socket, a first radially outer base portion having an annular recess on the inner, transverse face thereof for receiving said mouth of the socket therein, a second radially inner base portion, and an inner flange, a portion of radially inner surface of said outer flange, the axial inner surface of said first base portion and the radially outer surface of said second base portion defining in combination said annular recess, said second base portion and said inner flange of the locking ring co-operating with said inner surface of the socket

to define a substantially but not completely enclosed annular space, said sealing ring having an annular portion received and



located in said annular space to lock said sealing ring in said position within said socket.

4,108,447

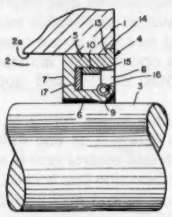
SHAFT SEAL

Harold W. Scholin, 1125 N. Northwest Hwy., Park Ridge, Ill. 60068

Filed Aug. 12, 1977, Ser. No. 823,999

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—153 **1 Claim**



1. A shaft seal assembly adapted to be inserted into the bore of a housing and around a shaft therein comprising,

(a) an annular molded elastomeric sealing member having an annular sealing lip on the inner diameter thereof adapted to be in sealing engagement with a shaft in said bore,

(b) the surface of the outer diameter of said sealing member being in engagement with the inner surface of the bore in which it is located,

(c) an annular recess in said sealing member extending inwardly in an axial direction from one side of said member,

(d) spring means in said recess adapted to yieldingly urge said sealing lip into sealing engagement with the shaft,

(e) a separate and removable reinforcing ring member having the surfaces thereof extending in a radial direction and positioned against the bottom of said annular recess in unsecured relation to said sealing member, and

(f) a separate and removable split spring ring member, substantially rectangular in cross-section, positioned in said annular recess outwardly of said reinforcing ring member, and adapted to yieldingly urge the surface of the outer diameter of said sealing member into sealing engagement with the inner surface of the bore, the inner surface of said split spring ring member bearing against said reinforcing ring to hold said reinforcing ring in place and prevent outward movement thereof.

4,108,448

PISTON RING ASSEMBLY

George J. Anderson, Hagerstown, and Roscoe Lee Bell, Springport, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Oct. 28, 1976, Ser. No. 736,676

Int. Cl.[2] F16J *9/02*

U.S. Cl. 277—157 **12 Claims**

1. A piston ring assembly comprising an outer annular ring including an outer face adapted to slidingly and sealingly engage the wall of a cylinder, said outer ring defining at least one spring receiving recess, said recess comprising a generally annular surface having a predetermined radius, and an annular expansion spring of generally U-shaped cross section having at least one leg extending within said at least one recess and extending outwardly toward said outer face of said outer ring, said at least one leg having a plurality of feet, each of said feet having a surface, at least a portion of said surface of each of said feet being in contact with said annular surface of said recess, wherein said surfaces of said feet have a radius less than said predetermined radius of said recess surface.

4,108,449

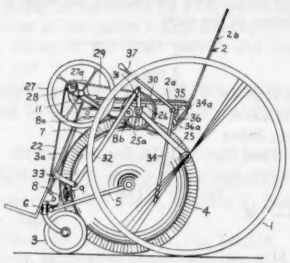
STAIR-CLIMBING WHEELCHAIR

Thomas J. Rhodes, 508 Vilage View Pl., Fallbrook, Calif. 92028

Filed Jan. 31, 1977, Ser. No. 764,060

Int. Cl.[2] B62B *5/02*

U.S. Cl. 280—5.28 **14 Claims**



1. A wheelchair, the combination of:

(a) a body having a seat structure;

(b) main wheels and secondary wheels mounted on said body for supporting said body while said wheelchair is travelling over a relatively even surface;

(c) climbing and descending means for said body normally in a non-operating position; and

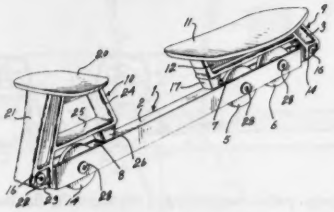
(d) means for raising said main wheels rearwardly relative to said body and for moving said climbing and descending means into operating position whereby said body is supported by said main wheels and said climbing and descending means for enabling said wheelchair to climb or descend.

4,108,450

ROLLER SKATE

Bernard Cote', 12,270 St. Evariste St., Montreal, Canada

Filed Apr. 26, 1977, Ser. No. 791,008
Claims priority, application United Kingdom, Apr. 28, 1976, 17226/76
Int. Cl.[2] A63C *17/18*
U.S. Cl. 280—7.13 5 Claims



1. A roller skate including three rollers to be rotatably mounted to the bottom of a shoe in alignment with the longitudinal axis of the shoe, characterized in that the rear and middle rollers are spaced apart a greater distance than the distance between the middle and front rollers, and are located on each side of the vertical line passing through the center of gravity of a person standing up on the skate, the ground contact zone of the front roller being at a higher level than that of the rear and middle rollers, an elongated roller carrying bar and a pair of separate shoe supporting frames securable to a shoe sole and each detachably secured to said bar, whereby bars of different lengths may be secured to the same shoe supporting frames to fit shoes of different sizes, each shoe supporting frame being detachably secured to said bar at two spaced zones, namely: at the front and back of each frame with the rear frame straddling the rear roller and the front frame straddling the middle and front rollers, and wherein the back of the rear frame and the front of the front frame have each a pair of spaced ears straddling the rear and front end portions of said bar respectively and nut and bolt means extending through registering holes in said ears and bar end portions to detachably secure said bar to said frames, and wherein the front of said rear frame and the back of said front frame have downwardly depending studs bearing on the top of said roller carrying bar.

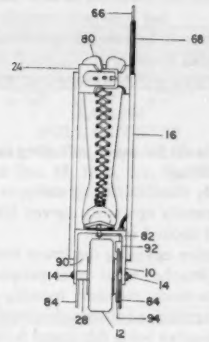
4,108,451

ROLLER SKATES WITH HAND BRAKES

Wilson Scheck, Sr., 2900 SW. 27th St., Gainesville, Fla. 32608

Continuation-in-part of Ser. No. 604,606, Aug. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 478,939, Jun. 13, 1974, abandoned. This application May 16, 1977, Ser. No. 797,479
Int. Cl.[2] A63C *17/14, 17/08*
U.S. Cl. 280—11.2 1 Claim

1. An improved roller skate in combination with a control belt worn around the user of the skates comprising;
- a frame having a top surface and two side surfaces extending perpendicularly down from said top surface,
- a carriage bolt extending through a hole in each of said extending surfaces of said frame,
- a wheel concentric to said carriage bolt in between said two extending surfaces,
- a shoe fixedly attached to the top of said frame,
- an ankle support iron fixedly attached to each of said extending surfaces of said frame, said irons extending perpendicular to and above said top surface of said frame,
- a disc wheel welded to one side of a rim of said wheel, said control belt fitting around the waist of the user, and
- braking means fixedly secured to said belt further consisting of:
  - a brake grip designed to be moved by hand operation,
  - a first cable secured to said brake grip,
  - second cables secured to said first cable, one running to each of of the skates to be worn,
  - a disc brake connected to the other end of said cable positioned to engage said disc wheel,



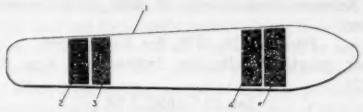
whereby upon the brake grip being squeezed by hand, the cables will move upward causing the disc brake to frictionally engage said disc wheel to decelerate and stop said skate.

4,108,452

SKATE BOARD SAFETY ACCESSORY

Richard Alan Baron, 26 A Cyprus La., Old Bridge, N.J. 08857

Filed Dec. 6, 1976, Ser. No. 748,275
Int. Cl.[2] A63C *1/18*
U.S. Cl. 280—11.3 8 Claims



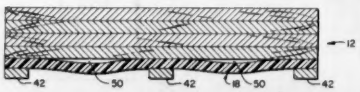
1. An accessory for a skate board, said skate board having a rolling means and an upper, riding surface, said accessory comprising two, interengagable, opposing elements, one of said elements comprising a thin, flexible, base sheet member having two, flat, opposing surfaces, one of said surfaces having a very large number of closely spaced hooking elements of flexible, resilient material attached thereto, with said hooking elements secured to said surface area of said base member generally in a vertical position extending from said surface, and an attaching means on the opposing flat surface, the second of said elements comprising a thin, flexible base member having two, flat, opposing surfaces, one of said surfaces having a very large number of closely spaced flexible loops of resilient material, the number of said loops being substantially greater than the number of hooking elements per unit area of said surface area, and an attaching means on the opposing flat surface area, whereby one of said elements is attachable by its respective attaching means to the riding surface of said skate board and the other of said elements is attachable by its respective attaching means to a foot of a rider of said skate board, so that when said foot having said element attached thereto is caused to contact the opposing member attached to said riding surface of said skate board, a number of said loops will engage a number of said hooking elements to secure the elements generally in a face-to-face relationship.

4,108,453

SNOWMOBILE FLOTATION SKI

Clair H. Lavalier, 308 2nd St., Parkville, Minn. 55773

Filed Aug. 24, 1976, Ser. No. 717,294
Int. Cl.[2] B62B 9/04
U.S. Cl. 280—28 6 Claims



1. A snowmobile ski for use in soft, deep snow, ice, or slush conditions, comprising:

an elongate body member having an upper surface, a lower surface, a generally upwardly curved forward end, and a width at least about 8 inches;

a sheet-like overlay covering the lower surface of the body member and attached to an outer periphery of the lower surface of the body member, forming at least one air pocket in the interstice between the overlay and the lower surface, the overlay being fabricated from a smooth, thin, flexible, air-impervious material;

means for attaching and substantially hermetically sealing the overlay to the outer periphery of the lower surface of the body member, the attachment means holding the overlay snug against said lower surface; and

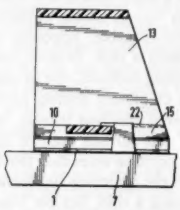
means attached to the upper surface of the body member for releasable attachment of the ski to a snowmobile.

4,108,454

ARRANGEMENT FOR SECURING A BODY TO A SKI

Günter Schwarz, Steinacherstr. 67, 8804 Au-Wadenswil, Switzerland

Filed Jul. 26, 1976, Ser. No. 708,695
Claims priority, application Switzerland, Aug. 6, 1975, 10352/75
Int. Cl.[2] A63C 5/06
U.S. Cl. 280—11.37 E 11 Claims



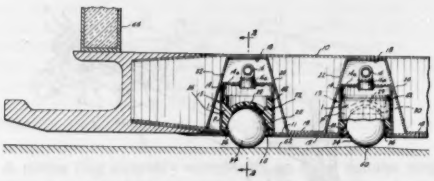
11. An attachment arrangement for securing an upstanding body to a ski, comprising an upstanding body having a substantially plate-shaped base portion, an attachment plate adapted to be secured to the ski, an elastic, resiliently compressible intermediate layer interposed between the base portion and the attachment plate, means extending upwardly from the attachment plate for releasably securing the upstanding body to the attachment plate in a locked position, sliding surface means arranged between said intermediate layer and said base portion and extending substantially parallel to the attachment plate for enabling sliding movement of the upstanding body in a direction relative and substantially parallel to the attachment plate from an unlocked position to said locked position.

4,108,455

CARGO PALLET INCORPORATING RETRACTABLE BALL UNITS

Varnell L. James, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1975, Ser. No. 642,748
Int. Cl.[2] B62D 21/18
U.S. Cl. 280—43.23 12 Claims



1. A cargo pallet comprising: a substantially flat base including frame means for supporting cargo and for engaging a support surface, said frame means having an upper and lower surface;

a plurality of spaced-apart roller means disposed within said frame means, each roller means including an open-bottomed cylinder attached to said frame means, said cylinders being disposed within a corrugated intermediate member interengaging and supporting said upper and lower surface, and wherein each cylinder is at least partly retained in position by an upturned lip portion formed in said lower surface;

a piston having a lower skirt portion and being retained in a vertically reciprocal, fluid-tight relationship within each said cylinder;

a spherical roller rotatably retained within a semi-spherical chamber defined by said lower skirt portion of each said piston; and,

pneumatic fluid distribution means interconnecting said cylinders, said fluid distribution means adapted to supply said cylinders with a source of pressurized pneumatic fluid; whereby pneumatic fluid is selectively supplied to and exhausted from all cylinders to reciprocate each piston between an upper, retracted position in which each said spherical roller is contained within said pallet base and a lower, extended position in which at least a portion of each said spherical roller protrudes through said lower surface.

4,108,456

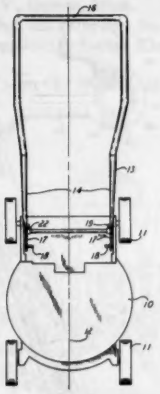
LAWN MOWER HANDLE MOUNTING

Neill Carl Woelffer, Racine, and Merlin Howard Grandrud, Sturtevant, both of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

Filed Jul. 15, 1977, Ser. No. 815,815
Int. Cl.[2] B62B 3/00
U.S. Cl. 280—47.37 R 7 Claims

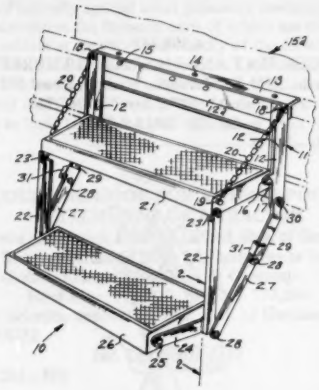
1. A lawn mower handle mounting comprising a mower, a mower handle having two ends repsectively pivotally attached to opposite sides of said mower for up and down pivotal movement and with said ends being spring-urged in the horizontal direction toward the respective opposite sides of said mower, said ends each including a portion spaced from the pivot axis and with each said portion having a fixed vertical dimension, each side of said mower having two surfaces vertically spaced apart and disposed one above the other respectively above and below said handle portions and in contact therewith for securing said handle onto said mower, the respective ones of said two surfaces being angled relative to each other and presenting a wedge-shaped space therebetween and with a portion of each of said mower sides extending between said two surfaces and defining the bottom of said wedge-shaped space, and with the smaller dimension of said wedge-shaped space being less than

said fixed vertical dimension of said leg portions, all for snug mounting of said handle by spring urging said leg portions into



said wedge-shaped space and against said two surfaces while being spaced from the respective said mower portions.

4,108,457
CAMPER STEPS
Dale Garrett, Rte. 1, Box 354, Rockaway, Oreg. 97136
Filed Aug. 9, 1976, Ser. No. 712,840
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **2 Claims**



1. Foldable steps for use on a camper vehicle or the like comprising:

a frame for mounting on the vehicle;

a first step pivotally connected at its rear portion to said frame for swinging motion between a retracted, substantially vertical position and an extended, substantially horizontal position;

means for limiting the swinging motion of said first step below its extended position;

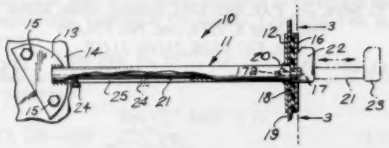
a pair of spaced-apart channel members, each being pivotally connected to the front portion of opposite sides of said first step generally vertically disposed;

a second step pivotally connected by folding means at opposite sides thereof to said channel members for folding between a retracted position in which said second step is substantially coplanar with said channel members, and an extended position in which said second step extends horizontally outwardly from the bottom region of said channel members;

said folding means including a pair of pins, each projecting outwardly from the rear portion of an opposite side of said second step and received within an associated one of said channel members for slidable movement therewithin, and a pair of rods, each pivotally connected at one end thereof to the front portion of opposite sides of said second step and at its other end to the lower portion of an associated one of said channel members; and

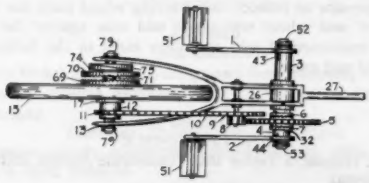
means for maintaining the vertical disposition of said channel members when said first step is extended.

4,108,458
PULL OUT-STEP
Charles Owens, 412 Neal St., Baytown, Tex. 77520
Filed Dec. 15, 1976, Ser. No. 750,966
Int. Cl.² B60R *3/02*
U.S. Cl. 280—166 **1 Claim**



1. A pull-out step for an automotive vehicle, comprising in combination, a length of pipe, which is received within an opening provided in the lower portion of a front fender of a vehicle, and an opening in a first plate, and one end of said pipe is flush with the outside of said fender, said first plate being in abutment with the inner side of said fender, said pipe being welded to an off-set second plate that is secured rigidly to the chassis of the vehicle by suitable fasteners, a rod slidably received in said pipe, said rod being extendible outward from the exterior of said fender, and a third plate is fixedly secured to the end of the said rod, which extends out of said pipe, and a flat rubber gasket is fixedly secured to said fender and is provided with an opening smaller than the diameter of said rod, so as to retain said rod frictionally against sliding in or out of said pipe when not in use, and a set screw secured in said rod is slidable within a slot of said pipe and prevents rotation of said rod, and when urged against an end of said slot, provides linear stop means for said rod, when it is pulled out of said pipe.

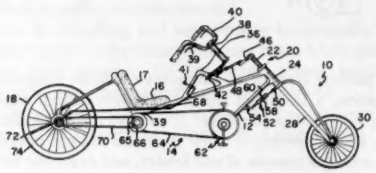
4,108,459
SPRING POWERED BICYCLE
Mario Filippo Alvigini, 217 W. 18th St., New York, N.Y. 10011
Filed Mar. 29, 1977, Ser. No. 782,533
Int. Cl.² B62M *1/04*
U.S. Cl. 280—215 **3 Claims**



1. A propulsion assembly for a rider propelled vehicle having a frame and a ground engaging wheel mounted on said frame, said assembly comprising: a first sprocket wheel, means drivingly connecting said first sprocket wheel to said ground engaging wheel, a second sprocket wheel, a transmission chain drivingly interconnecting said first and second sprocket wheels, a spur gear drivingly connected to said second

sprocket wheel, a drive wheel gear in meshing engagement with said spur gear, a fixed shaft, two cylindrical oscillating shafts journaled on said fixed shaft, on opposite sides of said drive wheel gear, respectively, a one way clutch interconnecting each of said oscillating shafts to said drive wheel gear, a cylindrical housing journaled on one of said oscillating shafts, two radially extending slots in said one oscillating shaft, fastener means extending through said slots to secure said housing and said fixed shaft to said frame while allowing rotation of said one oscillating shaft within said housing and on said fixed shaft, a lever arm mounted on each of said oscillating shafts, and a foot pedal on the rear portion of each said lever arm whereby said lever arm is depressed backwardly to drive said vehicle.

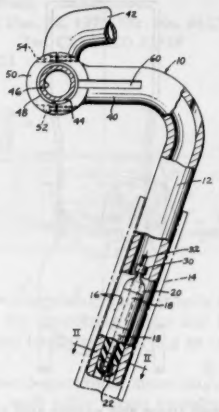
4,108,460
AMPLIFIED CYCLE STEERING SYSTEM
John C. Silva, Jr., P.O. Box 1082, Saugus, Mass. 01906
Filed May 5, 1975, Ser. No. 574,409
Int. Cl.[2] B62K *21/10, 21/18*
U.S. Cl. 280—236 **12 Claims**



1. A multi-wheel cycle comprising, a steering column rotatably mounted on said cycle at a cant of between 20° and 60° with the longitudinal axis of the cycle frame, a steering wheel mounted on the lower portion of said steering column, an amplified steering system for said cycle including, a first lever means on the upper portion of said steering column sized to describe a relatively small arc per degree turn of said column and wheel, manual steering means rotationally mounted on said cycle on a second rotatable column positioned aft and extending above said first lever means, a second lever means mounted on said second rotatable column below said manual steering means, means operatively connecting said first and second lever means, said second lever means being sized to describe a relatively large arc per degree turn of said manual steering means such that a turn of said manual steering means is amplified to a greater turn of said steering column and wheel and weight-adjustable, anti-jackknifing resilient means including, a rigid arm mounted on the rotatable steering column and tension spring means, adjustable to the weight of the cycle operator, connecting said arm to a portion of the cycle frame and means for adjusting said spring in proportion to the weight of said operator to balance said steering wheel such that any turning of said wheel will pivot said arm against the so-adjusted resistance of said spring to assist in the balanced steering of said cycle.

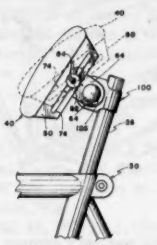
4,108,461
BICYCLE SPINDLE
James H. Hopper, 1 Taylor Rd., Hazardville Station, Enfield, Conn. 06082
Filed Apr. 5, 1977, Ser. No. 784,907
Int. Cl.[2] B62K *21/16, 21/20*
U.S. Cl. 280—279 **6 Claims**

1. In a spindle for connection to the upper region of a bicycle frame, a leg adapted for insertion into the frame from above, a slot formed in the lower portion of said leg, a resilient block in said slot, means accessible from the upper end of said leg for compressing said block axially thereby to expand said block radially to spread said lower portion of said leg, a rigid element fitted into each end of said slot at opposite ends of said block and said means comprises a screw threaded into the lower one



of said elements and having a head thereon in the upper side of the upper of said elements.

4,108,462
BICYCLE SEAT AND MOUNTING THEREFOR
Lee D. Martin, 2321 E. Murdock, Wichita, Kans. 67214
Filed Feb. 11, 1977, Ser. No. 767,734
Int. Cl.[2] B62J *1/00*
U.S. Cl. 280—289 E **8 Claims**



1. Apparatus for mounting a bicycle seat upon the seat support post of a bicycle comprising a mounting bracket adapted to be secured to a bicycle seat, a connector secured to the bracket for linear movement relative thereto, means for releasably securing the connector to the bracket in a selected relative position, a clamp means adapted to clampingly engage a bicycle post, said clamp means being pivotally carried by the connector, and a common means for securing the clamp means in a selected pivotal relation to the connector and for actuating the clamp means, said bracket being a channel member comprised of a web connecting a pair of flanges, said flanges having a pair of elongated slots therein, said connector being slidably and guidingly received between the flanges of the bracket, with said means for releasably securing the connector to the bracket comprising threaded means engaging the connector and extending through the slots.

4,108,463

IMPLEMENT SUPPORT LINKAGES

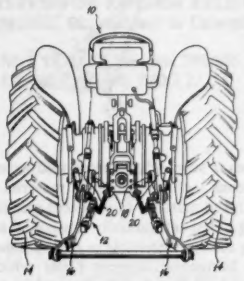
John Leslie Old, Kenilworth, England, assignor to Massey-Ferguson Services N.V., Detroit, Mich.

Filed Dec. 20, 1976, Ser. No. 752,047

Claims priority, application United Kingdom, Dec. 24, 1975, 52791/75

Int. Cl.[2] B60D 1/14

U.S. Cl. 280—460 A 10 Claims



5. An implement support linkage in combination with a vehicle, said implement support linkage comprising:

a pair of laterally spaced apart rearwardly extending elongated lower draft links, the forward ends of which are connected to laterally spaced apart portions of the vehicle;

a pair of adjustable stops mounted on the inner rearward side portions of the lower draft links; and

a pair of laterally spaced apart generally rearwardly extending stabilizers the forward ends of which are connected to the vehicle at locations outwardly of the forward ends of the lower draft links, and each of the stabilizers being provided with a rearward extension which traverses one of said draft links and is adapted to contact an adjustable stop to limit lateral sway of said lower draft links.

4,108,464

COUPLING HOOK FOR A THREE-POINT ATTACHMENT OF A TRACTOR

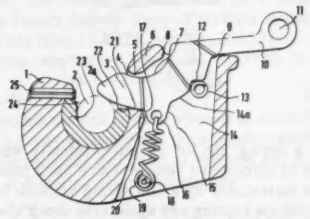
Wilhelm von Allwörden, Erbach i.O, Fed. Rep. of Germany, and Dieter Kunze, Clarendon Hills, Ill., assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,089

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618332

Int. Cl.[2] B60D 1/10

U.S. Cl. 280—508 5 Claims



1. A coupling hook for a guide-member of a three-point attachment of a tractor comprising a hook member having a hook opening and a pocket opening to a surface of the hook member, there being a passage between said pocket and hook opening, an arcuate latch element displaceable into said hook opening through said passage to block a coupling pin in said hook opening in a locked position and displaceable to a position to release the coupling pin, said latch element having an actuating lever rigidly attached thereto and projecting outwardly through the pocket opening, said latch element having inner and outer curvilinear surfaces opposed from each other, said hook member having a first fulcrum in the vicinity of said pocket opening engageable with said inner curvilinear surface and a second fulcrum in the vicinity of said passage engageable with said outer curvilinear surface, a bolt within said pocket and there being a notch in said outer curvilinear surface engageable with said bolt, said notch engaging said bolt and said outer curvilinear surface engaging said second fulcrum when said latch element is in its locked position.

4,108,465

SKI BRAKE

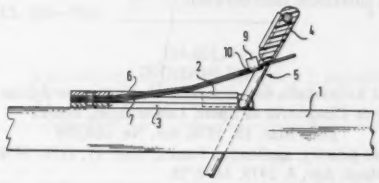
Manfred Schmidt, Sindelfingen, and Heinz Luithlen, Rutesheim, both of Fed. Rep. of Germany, assignors to Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH, Leonberg, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,310

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 7605720

Int. Cl.[2] A63C 7/10

U.S. Cl. 280—605 4 Claims



1. A ski brake for a ski comprising a brake member, a bearing member having bearing means formed thereon for pivotably carrying said brake member, spring means for pivoting said brake member about a transverse axis of the ski into a braking position, said spring means comprising a main leaf spring provided on said bearing member extending to said brake member, an attachment member fixed to the ski, said spring means further comprising an additional leaf spring provided on said attachment member, coupling means on said bearing and attachment members for easy detachable connection of said bearing member with said attachment member with said additional leaf spring supporting said main leaf spring, said coupling means further providing a guide for movement of said bearing member longitudinally of the ski, and detachable fixing means on said main and additional springs for interconnecting said springs and securing said bearing member against said movement.

4,108,466

SKI BRAKE

Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwechat, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Jun. 23, 1977, Ser. No. 809,192

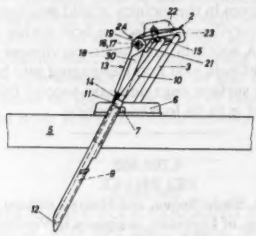
Claims priority, application Austria, Jun. 25, 1976, 4688/76; Jul. 9, 1976, 5033/76

Int. Cl.[2] A63C 7/10

U.S. Cl. 280—605 10 Claims

1. In a run-away preventing device for a ski having a bar with brake legs supported on said ski, said bar being movable automatically under spring action into a braking position wherein said brake legs project downwardly from said ski on opposite sides thereof, a holding plate secured to said ski and step-on means pivotally secured to said holding plate, said bar having two extensions extending from each of said brake legs,

one of which is pivotally supported on said holding plate and thereafter extends to said step-on means and the other extension extends directly to said step-on means, the improvement comprising wherein said step-on means includes a lever arm and first pivot means pivotally securing said lever arm to said holding plate, a stepping plate and second pivot means pivot-



ally securing said stepping plate to said lever arm, said second pivot means including an axle fixed to one of said lever arm and said stepping plate and receiving means on the other of said lever arm and said stepping plate for receiving said axle therein and shoulder means on one of said stepping plate and said lever arm and engageable with the other thereof to limit the relative pivotal movement therebetween.

4,108,467

SKI BINDING

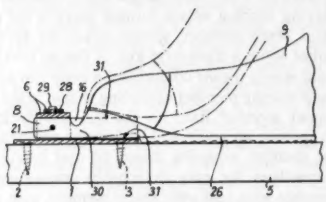
Armand Kreyenbuhl, Samoens, France, assignor to Adidas Fabrique de Chaussures de Sport, Landersheim, France

Filed Mar. 15, 1976, Ser. No. 666,589

Claims priority, application France, Mar. 17, 1975, 75 08182; Switzerland, Apr. 9, 1975, 4490/75

Int. Cl.[2] A63C *9/18*

U.S. Cl. 280—615 **18 Claims**



14. A cross-country ski binding and ski shoe assembly comprising:

a ski shoe including a flexible sole with a relatively rigid integral extension of said sole protruding at the front of the shoe, said rigid extension being flexibly connected to the sole by a thinner section, and surface means on said rigid extension for engaging a binding and surface means on said extension for securing the shoe to the binding.

4,108,468

SLEEPER ADAPTER FOR A COLLAPSIBLE BABY STROLLER

Isidoro Orlanski, 116 Magnolia La., Princeton, N.J. 08540

Filed Dec. 30, 1976, Ser. No. 755,754

Int. Cl.[2] B62B *11/00*

U.S. Cl. 280—648 **20 Claims**

1. A collapsible baby stroller apparatus comprising:

a collapsible frame means including a pair of oppositely disposed parallel elongated seat supporting members;

wheel means connected to said collapsible frame, said wheel means comprising a plurality of wheels all lying in a common plane when said stroller apparatus is in the uncollapsed state, said elongated members having a diagonal relationship with respect to the plane of said wheels in said uncollapsed state;

seat means attached to said collapsible frame;

extension means connected to said parallel elongated members for extending the effective length of said elongated members;

a sling means suspended across said extension means, said sling means including support material which is continuous with the material of said seat means, said sling means creating a first substantially horizontal support plane; and,

a levelling means receivable in said seat means for creating a second horizontal support plane which is substantially coplanar with the first horizontal support plane of said sling means.

4,108,469

SPRING LEG WITH MOUNTING FOR THE FRONT WHEELS OF AUTOMOBILE VEHICLES

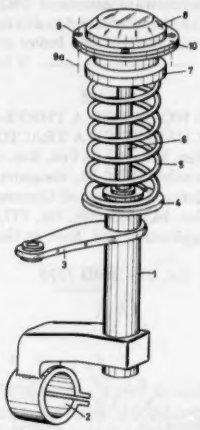
Jörg Schwarzbich, Mozartstrasse 10, 4803 Steinhagen, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,191

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630462

Int. Cl.[2] B60G *11/58*

U.S. Cl. 280—668 **14 Claims**



1. In a spring leg for an independently suspended front wheel of an automotive vehicle which has a piston-type shock absorber surrounded by a coil spring wherein one end of the spring rests via a spring cup against the shock absorber's piston rod which rests via a ball bearing assembly against the vehicle's body, the improvement comprising a circumferential groove in the upper end of the piston rod of the shock absorber to provide the inner race for the balls of the ball bearing, a first collar-shaped metal ring surrounding the piston rod which has a portion so shaped and positioned to provide a portion of the outer race for the balls of the ball bearing, said first metal ring having a flange radially extending from said shaped portion

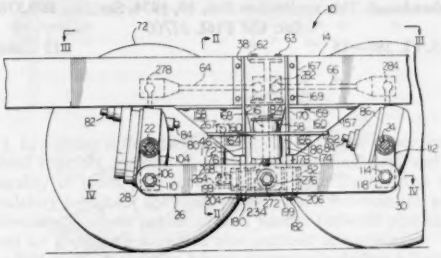
and for fixing to the body of the vehicle, and a second collar-shaped metal ring surrounding the piston rod axially displaced from said first metal ring and surrounding the piston rod, said second metal ring having a portion so shaped and positioned to complete the outer race for the balls of the ball bearing and having a flange radially extending from said shaped portion for resting against the flange of said first metal ring.

4,108,470

SUSPENSION SYSTEM FOR TANDEM AXLE VEHICLES

David S. Vinton, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 18, 1977, Ser. No. 798,055
Int. Cl.[2] B62D *61/00*; B60G *11/52*
U.S. Cl. 280—677 **6 Claims**



1. A suspension system for tandem axle vehicles, comprising:
- a first equalizer beam connected at opposite ends thereof to the tandem axles;
- a second equalizer beam spaced from the first equalizer beam and connected at opposite ends thereof to the tandem axles;
- first and second spaced frame portions of the vehicle;
- a first bracket rigidly connected at a first end thereof to the first frame portion of the vehicle and resiliently connected at a second end thereof to the first equalizer beam;
- a second bracket rigidly connected at a first end thereof to the second frame portion of the vehicle and resiliently connected at a second end thereof to the second equalizer beam;
- a torque tube assembly connected at opposite ends thereof to the frame portions; and
- a crossbeam member connected at opposite ends thereof to the first and second equalizer beams and extending through the torque tube assembly.

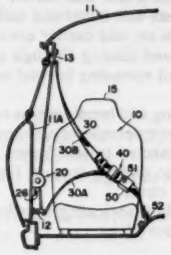
4,108,471

SEAT BELT SYSTEM

Yutaka Kondo, and Shuho Nishina, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 12, 1977, Ser. No. 796,323
Claims priority, application Japan, Jul. 26, 1976, 51-88876
Int. Cl. B60r *21/10*
U.S. Cl. 280—747 **5 Claims**

1. A three points seatbelt system wherein in normal use the seatbelt is completely extended and the seatbelt extends diagonally across the shoulder and chest of the user and across the lap of a user, said seabelt system comprising:
- a base;
- a retractor shaft rotatably supported by said base having a belt passageway there through;
- a means for applying a retracting force to said retractor shaft; and
- a continuous restraining belt extending through said passageway in said retractor shaft and the two portions of said belt extending from said shaft form a lap and a shoulder belt, said shoulder belt portion of said continuous restraining belt being drawn upwards and being inserted through an upper slip joint, and said lap belt portion of said continuous restraining belt being drawn downwards and being inserted through a lower slip joint.

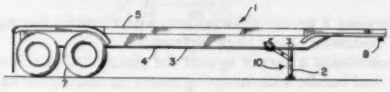


4,108,472

FOLD BACK LANDING GEAR LEG

Gary L. Weir, Denton, Tex., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 26, 1977, Ser. No. 791,107
Int. Cl. B60s *9/02*
U.S. Cl. 280—763 **4 Claims**



1. In a trailer underframe having a pair of laterally spaced longitudinally extending side rails and a pair of longitudinally spaced crossmembers extending therebetween, the improvement comprising a folding landing gear, including:
- a pair of downwardly depending legs having intermediate and lower bracing members extending therebetween,
- hinge means proximate one of said crossmembers coupling the upper ends of the legs to the side members and accommodating movement of the legs between a vertical trailer supporting position to an essentially horizontal stowed position nestled within the trailer underframe,
- bracket means depending from the second of said crossmembers intermediate the side rails,
- a longitudinally extending leg rigidifying strut having a lower end portion hingedly secured to said intermediate bracing member and an upper end portion reciprocably carried within said bracket means,
- said bracket means including a pair of laterally spaced plates forming a depending clevis-like carrier for said strut and the upper portion of said strut being received therethrough, and
- locking means on said strut operatively associated with said bracket means to selectively secure the gear legs in their respective vertical and stowed positions.

4,108,473

PERFECT BOUND SAMPLE BOOK WITH INTEGRAL HANDLE

Manus Coen, Passaic, and Joseph Bonfield, Clifton, both of N.J., assignors to Eastern Bindery, Inc., Paterson, N.J.

Filed Oct. 12, 1976, Ser. No. 731,426
Int. Cl.[2] B42D *3/00*
U.S. Cl. 281—29 **20 Claims**

1. A perfect bound sample book comprising:
- a leaf bundle;
- a carrier;

bonding means, fastening said carrier to said leaf bundle at the back of said leaf bundle;

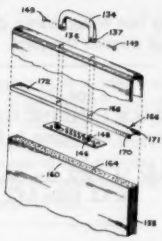
a cover having a spine with passage means therein, said cover disposed about said carrier so as to position said carrier between said cover and said leaf bundle;

mounting means on said carrier extending away from said leaf bundle, and passing through said passage means in said cover and extending beyond said cover;

handle means;

means connecting said handle means to said mounting means on said carrier externally of said cover so that said handle means is connected to said leaves of said book through said carrier, to directly support the leaf bundle independently of the cover.

11. The method of fabricating a perfect bound sample book comprising the steps of:



forming a group of leaves into a leaf bundle having a substantially planar back surface;

positioning a carrier against the planar back surface of the leaf bundle with mounting means on said carrier extending from said carrier away from said planar back surface;

bonding said carrier to the leaf bundle at the planar back surface of said leaf bundle to support the leaf bundle and to binde the leaf bundle;

positioning a cover about the carrier and the leaf bundle with the mounting means of the carrier passing through passages in the cover alligned with said mounting means, the mounting means extending beyond the cover;

fastening a handle directly to said mounting means passing through the passages in the cover to directly support the leaf bundle via the carrier independently of the cover, and to position the cover with relation to the leaf bundle.

4,108,474

FIXATION CLAMP FOR AIR PUMP HOSE

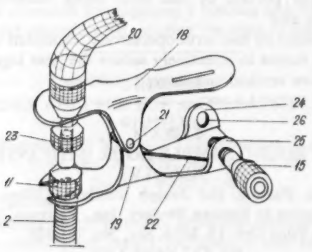
Paul Sigrist, Hauptstrasse 126, Orpund, Switzerland (CH-2552)

Filed Jan. 14, 1977, Ser. No. 759,573

Claims priority, application Switzerland, Jan. 15, 1976, 361/76

Int. Cl.[2] F16L *35/00*

U.S. Cl. 285—12 **1 Claim**



1. A fixation clamp for connecting a tube valve to an air pump hose comprising a pair of adaptors for mounting on said tube valve and said air pump hose to provide a connection, first and second arm members having work engaging ends for engaging said tube valve or its adaptor and said air pump hose end for biasing them toward each other, means pivotably securing said arms intermediate their ends, spring means between said arms adapted to normally draw said work engaging ends together, said work engaging end of said first arm having a U-shaped recess for engaging said tube valve or its adaptor, said work engaging end of said second arm having an orifice for engaging said air pump hose, and means on one of said arms for holding said adaptors when not in use.

4,108,475

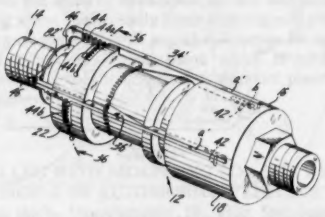
COUPLING DEVICE

Henry Fleischer, Little Falls, N.J. 07424

Division of Ser. No. 479,667, Jun. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 427,149, Dec. 21, 1973, abandoned. This application Feb. 19, 1976, Ser. No. 659,370

Int. Cl.[2] F16L *21/00*

U.S. Cl. 285—15 **13 Claims**



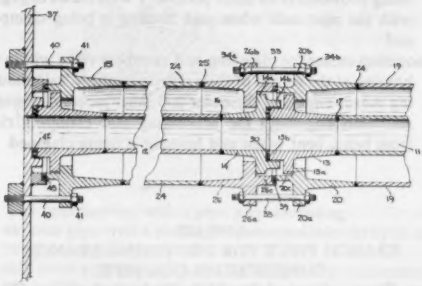
1. A coupling device comprising, in combination, a socket member and a plug member adapted to be removably and adjustably disposed in said socket member, said plug member including tapered outer walls and inner walls defining a bore running therethrough, and at least one securing means, said socket member comprising a body portion including inner walls defining a tapered passageway or segment, at least one wear resistant lining disposed between said tapered outer walls of said plug member and said tapered passageway of said socket member, said tapered outer walls of said plug member being adapted to seat in an initial portion of said tapered passageway of said socket member, to define said first position, and restricted to said initial position when so seated in that it cannot be moved deeper into the socket member, said plug member and said socket member by means of said lining forming a substantially fluid-tight seal between said members, and only after portions of said lining have worn, said plug member being adapted to be repositioned with respect to said initial portion of said passageway of said socket member to a second portion of said passageway to define a second position and thereby form, by means of said lining, a substantially fluid-tight seal with said socket member, said socket member further including at least one connecting member adapted to engage said securing means of said plug member to retain said plug member in said socket member in substantially fluid-tight engagement, said connecting member of said socket member comprising at least one connecting rod a portion of which is adjustably connected to said body portion of said socket member, said connecting rod being comprised of a first end portion, a second end portion which includes a latch-like member for attaching said connecting rod to said securing means of said plug member, and an intermediate portion, said intermediate portion including at least two rod positioning means comprising at least two teeth disposed along said connecting rod, said socket member further including at least one rod engaging means adapted to engage at least one of said teeth of said connecting rod to fix the position of said connecting rod with respect to said socket member and said plug member, and means to longitudinally adjust said connecting rod with respect to said socket member.

4,108,476

PRECOMPRESSED PIPING SYSTEM FOR HANDLING CRYOGENIC FLUID

Walter H. Krupp, 9350 Bolsa Ave., #61, Westminster, Calif. 92683

Filed Apr. 11, 1977, Ser. No. 786,608
Int. Cl.[2] F16L 5/02, 25/00, 39/04, 51/00
U.S. Cl. 285—47 6 Claims



1. In a piping system having a plurality of inner pipe sections joined together to form a conduit for carrying fluid and a plurality of outer pipe sections joined together to form an insulating jacket for the inner pipe sections, wherein the improvement includes means at each joinder between pipe sections for precompressing said pipe sections, comprising:

a first inner pipe section having a coupler including a flange attached to one end thereof, said flange having flat face and flat rear portions lying in planes substantially normal to the longitudinal axis of said first inner pipe section, said coupler further including an annulus extending from the face portion of said flange to form the unattached end of said coupler,

a first outer pipe section surrounding said first inner pipe section and having a coupler including a flange attached to one end thereof, said outer pipe section flange having a flat face portion and a flat rear portion lying in planes normal to the longitudinal axis of said first outer pipe section and a set of apertures therein, said first inner pipe section being slightly longer than said first outer pipe section such that said one end of said first inner pipe section and the flange thereof extend out from said first outer pipe section beyond said one end of said first outer pipe section,

a second inner pipe section having a coupler including a flange attached to one end thereof, said second inner pipe section flange having a flat face portion and a flat rear portion lying in planes substantially normal to the longitudinal axis of said second inner pipe section, said second inner pipe section coupler having an annular sleeve extending from the face portion of said second inner pipe section flange to form the unattached end of said second inner pipe section coupler, said sleeve being adapted to fit over the annulus of said first inner pipe section coupler,

a second outer pipe section having a coupler including a flange attached to one end thereof, said last mentioned flange having a flat face portion lying in a plane substantially normal to the longitudinal axis of said second outer pipe section, and a set of apertures formed therein positioned and formed to mate with the apertures of said first outer pipe section, and

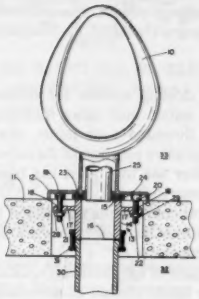
means for clamping the flanges of said outer pipe sections together with the apertures thereof in alignment so as to draw the flat face portions of said outer pipe section flanges towards each other, the flat face portion of said second outer pipe section flange being drawn into abutment against the flat rear face of said second inner pipe section and the flat face portion of said first outer pipe section flange being drawn into abutment against the flat rear portion of said first inner pipe section, with the sleeve of said second inner pipe section coupler engaging the annulus of said first inner pipe section coupler and applying pressure thereagainst as the outer pipe section flanges are drawn towards each other, thereby longitudinally compressing the first inner pipe section.

4,108,477

WASTE DRAIN CONNECTION FOR PLUMBING FIXTURES

Earl L. Morris, Whittier, Calif., assignor to Acorn Engineering Co., Industry, Calif.

Filed Dec. 6, 1976, Ser. No. 747,522
Int. Cl.[2] F16L 55/00
U.S. Cl. 285—58 3 Claims



1. A vandal-proof waste outlet connection providing a removable fluid passageway between the waste drain outlet of a plumbing fixture supported independently from the plumbing pipes coupled to it and a waste-receiving plumbing pipe inlet, said waste drain outlet having a receptacle for receiving a fluid sealing gasket, comprising:

(a) a pipe having a smooth surface and at least two open ends and a pair of oppositely disposed, radially-extending arms having open portions therethrough and arranged on said pipe intermediate said open ends of said pipe, said arms disposed from said open pipe ends a distance at least as great as the depth of said receptacle for receiving a fluid sealing gasket therein;

(b) means for aligning one of said open ends of said pipe with said gasket, said gasket being disposed between said receptacle and the rim of said open pipe end, whereby said gasket extends radially beyond said rim, said alignment means disposed on the opposite side of the mounting wall for said independently supported plumbing fixture in the pipe chase area and thereby being inaccessible from outside of the pipe-chase area;

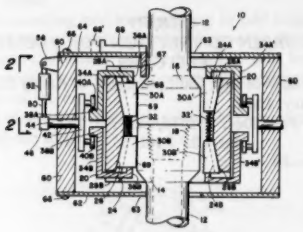
(c) means for adjustably connecting said arms to said plumbing fixture whereby said arms are movable towards or away from said gasket so that said one of said open ends of said pipe may be coupled in fluid sealing engagement with said gasket and disengaged therefrom as desired, said adjustment means disposed on the opposite side of the mounting wall for said independently supported plumbing fixture in the pipe chase area and thereby being inaccessible from outside of the pipe chase area; and

(d) a no-hub connection for coupling said one other open end of said pipe in fluid communication with said waste-receiving pipe, said no-hub connection disposed on the opposite side of the mounting wall for said independently-supported plumbing fixture in the pipe chase area and thereby being inaccessible from outside of the pipe-chase area.

4,108,478
MEANS TO PREVENT RELATIVE ROTATION OF THREADED TOGETHER PIN AND BOX TOOL JOINTS

Paul E. Lynch, Broken Arrow, Okla., assignor to Fenix & Scisson, Inc., Tulsa, Okla.

Filed Jul. 5, 1977, Ser. No. 812,475
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—82 **8 Claims**



1. In a rotary drilling system for drilling large-diameter boreholes, in the earth, and using multiple lengths of drill pipes, joined by threaded tool joints, the improvement in means to prevent relative rotation of threaded-together pin and box tool joints, after the tool joint has been made up to the proper torque, comprising:

(a) cylindrical retainer means positioned to surround a tool joint with an annular space between said tool joint and said retainer means;

(b) at least one pair of longitudinally slidable wedge or cam means on the inside surface of said retainer means;

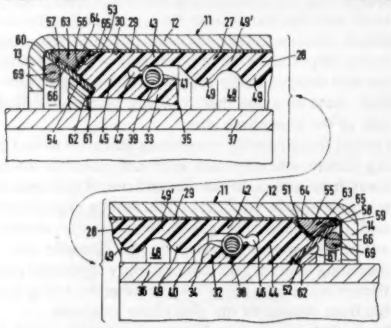
(c) hydraulic means to move said at least one pair of wedge or cam means longitudinally toward each other, along sloping grooves in said inside surface of said retainer means;

whereby as said cam means move toward each other, they move radially inwardly and press on the outer surfaces of said pin and box parts of said tool joints with a selected pressure; whereby said pressure of said cam means on said tool joints prevents relative rotation of said parts of said tool joint.

4,108,479
PIPE COUPLING

Immanuel Straub, 7323 Wangs, Switzerland

Filed Jul. 15, 1977, Ser. No. 816,269
Claims priority, application Austria, Jul. 21, 1976, 5376/76
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—112 **10 Claims**



1. A pipe coupling for coupling together the pipe ends of pipes which are to be interconnected, comprising:

a housing;

means for clamping the housing about the pipe ends intended to be interconnected;

a sealing gasket enclosed in said housing and possessing a substantially C-shaped axial cross-sectional configuration; said sealing gasket being open towards the inside and having end faces;

a respective substantially truncated cone-shaped clamping ring having an inner jacket surface and an outer jacket surface, each said outer jacket surface supporting thereat an associated one of said end faces of said sealing gasket;

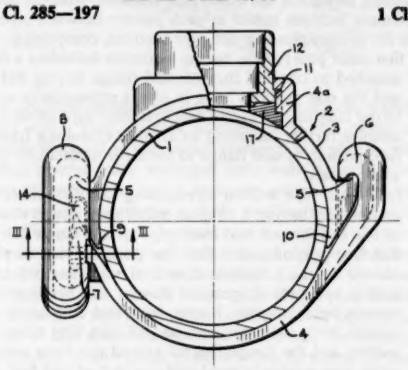
each of said clamping rings being retained at its outer periphery and in the axial direction within said housing and being provided at its inner periphery with claws engaging with the pipe ends when said housing is being clamped; and

mounting means for clamping said clamping rings within the housing at the region of their outer periphery, said mounting means engaging the outer and inner jacket surfaces of said clamping rings for preventing said clamping rings from being bent when said housing is being clamped.

4,108,480
BRANCH PIECE FOR PROVIDING BRANCH CONNECTIONS IN A PIPE

Ernst Ettema, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Continuation of Ser. No. 486,604, Jul. 8, 1974, abandoned. This application Jun. 7, 1976, Ser. No. 693,331
Int. Cl.[2] F16L *41/00*
U.S. Cl. 285—197 **1 Claim**



1. A branch piece for providing a branch connection in pipelines, comprising:

a first part (3) having a branch opening in a wall surface;

a second part (4) which is connectible with said first part (3) so that said first and second parts (3 and 4) together surround a pipeline (1);

said first part (3) being provided on both sides thereof with coupling ears (5) which extend parallel to each other and to the longitudinal axis of said first part (3);

said second part (4) being provided with a coupling edge (6) on a first side thereof, and a longitudinally-extending inclined ledge (7) on a second side thereof;

a wedge-shaped member (8) being provided with an inwardly-bent over endface (13), and which serves as an abutment member;

said wedge-shaped member (8) contacts at least a portion of said longitudinally-extending inclined ledge (7) and at least a portion of one of said coupling ears (5) to connect together said first and second parts (3 and 4);

said coupling edge (6) being capable of engaging the other one of said coupling ears (5);

said second part (4) being provided with a lip 16;

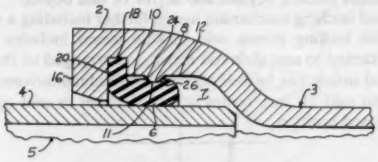
said inwardly-bent over endface (13) of said wedge-shaped member (8) is provided with an extension (13*a*); and

said extension (13*a*) is disposed behind said lip (16) on said second part (4).

4,108,481
GASKETED PIPE JOINT

Robert Malcolm Graham, Birmingham, Ala., assignor to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Dec. 6, 1976, Ser. No. 747,846
Int. Cl.[2] F16L 21/04
U.S. Cl. 285—231 4 Claims

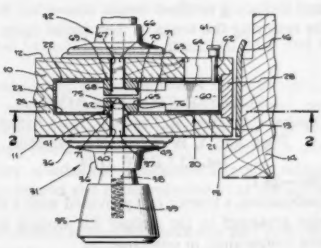


1. The combination with a pipe joint including:
a. an inner pipe with a plain end telescoped into the open end of an outer pipe,
b. said outer pipe having an axially elongated groove extending radially around its inside surface near said open end,
c. said axially elongated groove having gasket retaining means and a sealing wall,
d. said inner pipe having a plain end with an outside sealing wall,
e. a resilient gasket in said elongated groove,
f. said resilient gasket having a retaining portion cooperating with said retaining means to prevent said gasket from being dislodged from said joint and a sealing portion, said sealing portion having an outer surface,
g. the improvement which comprises an integral compression rib located between a forward gasket sealing wall and rear gasket sealing wall of said outer pipe and having a sealing face, said rib protruding radially inwardly into said axially elongated groove, said rib being so positioned that the thickest part of said sealing portion of said gasket contacts said rib and a portion of said outer surface of said sealing portion of said gasket does not contact said forward gasket sealing wall whereby said sealing portion of said resilient gasket is radially compressed between said compression rib and said outside sealing wall of said inner pipe.

4,108,482
DISENGAGING SPINDLE LOCKING MECHANISM

Hagen Dietrich, Delta; William J. Fane, North Vancouver, and Joseph Potschka, Vancouver, all of Canada, assignors to Norris Industries, South Gate, Calif.

Filed Oct. 20, 1977, Ser. No. 843,939
Int. Cl.[2] E05B 55/06
U.S. Cl. 292—165 9 Claims

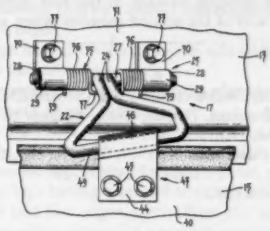


1. In a lock mechanism comprising a frame, a reciprocating latch bolt mounted in the frame, a retract arm movably mounted on the frame in a position of engagement with the latch bolt for withdrawing said latch bolt and a retract hub having a rotatable mounting on the frame in operating engagement with the retract arm, a disengaging spindle locking mechanism for guarding the hub against unauthorized rotation comprising a locking slide having a reciprocatable mounting on the frame, a shoulder on the hub adapted to engage the slide in locking position, means forming a non-circular opening in said hub, a spindle having an axially movable non-rotatable engagement with the non-circular opening in the hub for rotating said hub through a latch bolt actuating cycle, a first cam element on said spindle, a second cam element on an adjacent portion of said slide, said spindle being subject to axial movement by action of said cam elements to a position of disengagement from said hub, whereby to permit rotation of the spindle independent of the hub.

4,108,483
LATCHING DEVICE

John F. Hern, Southfield, and Joseph L. Buccellato, Warren, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 8, 1977, Ser. No. 813,907
Int. Cl.[2] E05C 3/04
U.S. Cl. 292—272 7 Claims



1. In a latching arrangement for a first door panel and second complemental panel comprising, means for holding said first and second panels at an angle to one another including a handle member, means pivotally mounting said member to said first panel between inoperative and operative positions, means connected to said member and said first panel for normally biasing said member into its inoperative position, and means connected to said second panel to engage said member in its operative position, said member including a peripheral portion opposite said pivotal mounting means and wherein the axis of said peripheral portion is inclined relative to the pivotal axis of said pivotal mounting means of said member, whereby said biasing means urges said member into engagement with said connecting means and said peripheral portion inclination militates against disengagement of said member and said connecting means to maintain them in locking engagement.

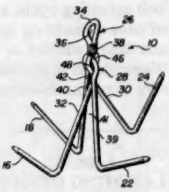
4,108,484
COLLAPSIBLE GRAPPLE

Richard R. Malroit, 9142 N. Bennett, Skokie, Ill. 60203

Filed Jan. 4, 1977, Ser. No. 756,730
Int. Cl.[2] B66C 1/34
U.S. Cl. 294—66 R 6 Claims

1. A collapsible grapple comprising first and second substantially planar members, said first member comprising a first pair of elongate shanks and a top portion joined to said shanks for defining a slot therebetween, said first pair of shanks further including lower ends extending outwardly of said slot and terminating in pointed ends to form a first opposing pair of hooks at an angle to and substantially in the plane of said first pair of shanks, said second member comprising a second pair of elongate shanks and a top portion joining said second pair of shanks and said second pair of shanks curving inwardly below said top portion to a first confluence to form a first aperture to receive a connecting line, and curving outwardly below said

first confluence and back inwardly to a second confluence to form a second aperture to receive the first member, said second pair of shanks being spaced to define a slot below said second aperture and having lower ends extending outwardly of said slot and terminating in pointed ends to define a second opposing pair of hooks disposed at an angle to and in the same plane as said second pair of shanks, said top portion of said first



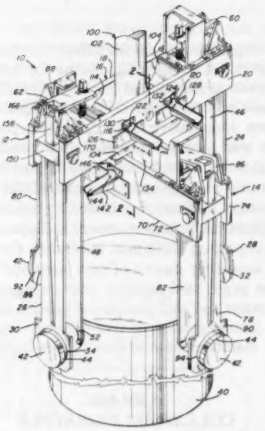
member traversing and pivotally engaging within said second aperture of said second member but confined against any substantial non-pivotal movement with said second pair of hooks generally perpendicular to said first pair of hooks, and with the upper portions of said first pair of shanks adjacent the second confluence positioned for permissive interfering engagement therewith in resisting rotation of the first member about the longitudinal axis of the second member when assembled.

4,108,485

REDUNDANT LIFT BEAM ASSEMBLY

Eugene W. Jennings, Denver, Colo., assignor to Stearns-Roger Corporation, Denver, Colo.

Filed Mar. 22, 1977, Ser. No. 780,235
Int. Cl.[2] B66C *1/10*
U.S. Cl. 294—67 BC **16 Claims**



1. A lift beam assembly for assisting in the lifting of heavy objects, the lift beam assembly comprising:

a. an elongated structural body having a means mounted near the midpoint of said body for engaging the hook of a lifting crane,

b. a pair of lift arm means, one of said arm means being pivotally suspended at each end of said body, said arm means having a suspended end and the arm means is arranged so that the suspended end pivots outwardly in a longitudinal direction beyond the end of said body, a coupling means provided near the suspended end of each lift arm means, said coupling means being provided for connecting the lift arm means to a heavy object to be lifted, and

c. latching mechanism means attached to each of said lift arm means whereby said lift arm means may be moved independently of the other lift arm means, said mechanism means having a pivotable lever attached at one end to said lift arm means and the opposite end attached to a slidable rod means whereby when said rod means is longitudinally moved the lift arm means pivots accordingly from a closed position where the coupling means connects said heavy object to an open position where said coupling means extends beyond and is free of said object,

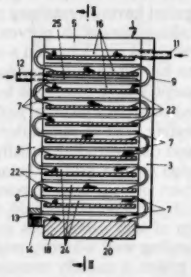
d. said latching mechanism means further including a releasable locking means, said locking means includes a key attached to said slide rod means and arranged so that said rod means can be held against longitudinal movement so that said lift arm means is locked either in said open or closed position.

4,108,486

INFLATABLE THRUST PRODUCING TOOL

Georg Hirmann, Zurich, Switzerland, assignor to Repapress AG, Romanshorn, Switzerland

Continuation of Ser. No. 600,949, Aug. 1, 1975, which is a division of Ser. No. 450,193, Mar. 11, 1974, Pat. No. 3,924,843.
This application Nov. 19, 1976, Ser. No. 743,118
Claims priority, application Switzerland, Mar. 9, 1973, 3498/73
Int. Cl.[2] B25B *1/00*
U.S. Cl. 294—99 R **7 Claims**



1. Tool comprising a force-producing device having at least one inflatable thrust producing member displaceable so as to apply a given force, a pivotally displaceable member engageable by said inflatable thrust producing member and pivotally displaceable thereby and a member on which said pivotally displaceable member is pivotally mounted on an axis about which the displaceable member pivots, and wherein said pivotally displaceable member is a lever handle movable relative to another member and forming tongs, and wherein said other member is another lever handle, with said inflatable thrust producing member being disposed between both said lever handles, and including resilient means connected to said lever handles for restoring the tongs to their initial open position.

4,108,487

SLEEPER STORAGE BINS

Larry L. Spohn, P.O. Box 54, Crescent, Iowa 51526

Filed Apr. 1, 1977, Ser. No. 783,850
Int. Cl.[2] B10P *3/34*
U.S. Cl. 296—28 C **4 Claims**

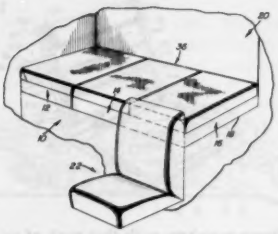
3. In combination, a tractor cab provided with a sleeper, and storage bins arranged in the sleeper for storing articles, the storage bins comprising, in combination:

(a) a plurality of receptacles arranged immediately adjacent one another in the sleeper of the tractor cab;

(b) a plurality of lids for covering the receptacles; and

(c) hinge means connected to the lids and receptacles for pivotally mounting the lids on respective ones of the

receptacles, and for supporting a mattress arranged in the sleeper, the hinge means pivotally mounts the lids on the receptacles in two different orientations for swinging movement substantially perpendicular to one another, three receptacles being arranged in side-by-side relation in the sleeper, with a center one of the receptacles having the



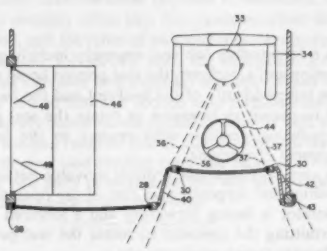
lid thereof pivotally mounted for swinging toward the back of the cab, and an outside pair of the receptacles having the lids thereof pivotally mounted for swinging away from one another, the arrangement of lids permitting selective access to the receptacles from the interior of the cab.

4,108,488

VEHICLE FRONT HAVING ASYMMETRICAL WINDSHIELDS

Keith W. Tantlinger, Coronada, Calif., assignor to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed Apr. 6, 1977, Ser. No. 784,954
Int. Cl.[2] B60J *1/06*; B60R *1/00*
U.S. Cl. 296—84 R **9 Claims**



1. A transit vehicle having an improved front end structure comprising:

a front end having a steering wheel and a driver's seat,

a pair of windshields mounted in said front end, one of said windshields positioned forwardly of the steering wheel and being referred to as the first or driver's windshield, the other windshield positioned laterally adjacent said first windshield and being referred to as the second windshield,

a vertical divider is mounted between said first and second windshields,

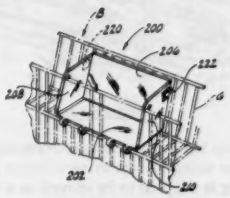
said first and second windshields being at different angles from a vertical axis whereby light from the interior lights and light reflections from passenger faces and clothing is reflected rearwardly from the interior surface of said windshields at different angles.

4,108,489

COLLAPSIBLE CHILD SEATS

Marilyn F. Salzman, 355 Dungate Dr., Chesterfield, Mo. 63017

Filed Dec. 20, 1976, Ser. No. 752,065
Int. Cl.[2] A47D *1/10*
U.S. Cl. 297—37 **6 Claims**



1. In combination, a shopping cart having a child seat structure including a horizontal platform extending along the entire width of said cart between two vertical side walls of said cart; and

a child seat fitted within said child seat structure, said child seat comprising:

a first panel having first and second side edges and first and second end edges;

a second panel having third and fourth side edges and third and fourth end edges;

said first, second, third and fourth side edges being shorter than the length of said platform;

first and second restraining flaps, each having a first edge coextensive with and hinged to a respective one of said first and second end edges of said first panel, each of said restraining flaps having a second edge adjoining a respective one of said first edges of said flaps and movable into coextensive relationship with a respective one of said third and fourth end edges of said second panel; and

securing means for releaseably securing each of said second edges of said restraining flaps in said coextensive relationship;

said shopping cart having an upstanding forward wall on one side of said platform and an upstanding rearward wall on the opposite side of said platform; said second panel being hinged to said shopping cart along said fourth side edge and being pivotable between a position against said rearward wall and a position on said platform; and, said first panel being affixed to the rearward side of said forward wall,

wherein, when said second edges of said restraining flaps are in said coextensive relationship, said restraining flaps are spaced from said side walls of said cart to thereby prevent a child placed within said child seat from falling laterally against said side walls of said cart.

4,108,490

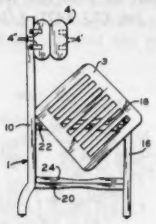
FOLDABLE CHAIR

Jose Antonio T. Marin, Hidalgo #214, Santa Ursula, Coapa Mexico City, Mexico

Filed Jul. 5, 1977, Ser. No. 812,820
Int. Cl.[2] A47C *4/08*
U.S. Cl. 297—42 **7 Claims**

1. In a foldable chair; a generally rectangular, one-piece seat member, a pair of front legs having upper ends, a pair of rear legs, upper and lower pairs of overlapped cross members with each cross member connected at one end to a rear leg and at the other end of the front leg diagonally opposed to the respective rear leg, pivot means pivotally connecting the cross members of each pair at the region of overlap thereof, means including the top cross member of the upper pair of cross members for supporting said seat member in a substantially horizontal position with two front corners respectively in general alignment with said front leg upper ends when the chair is erected,

and a single swivel connecting one of said front corners of the seat member to the respective front leg upper end whereby



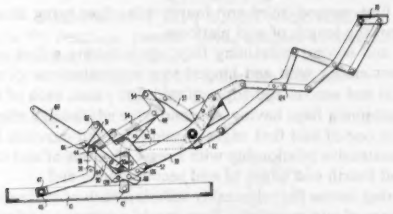
said seat member is adapted to be moved to a vertical position when the chair is folded.

4,108,491

WALL-AVOIDING RECLINER CHAIR

Walter Clark Rogers, Jr., Denton, N.C., assignor to Royal Development Company, Inc., High Point, N.C.

Filed Apr. 22, 1977, Ser. No. 789,958
Int. Cl.[2] A47C 1/02
U.S. Cl. 297—85 **34 Claims**



1. A reclining chair comprising in combination: a base, a seat, seat linkage means mounting the seat relative to the base for movement forwardly or rearwardly relative to the base as well as for movement into different reclining positions extending at an angle to the horizontal relative to the base, said linkage means including a carrier link, a seat link fixed to the seat, suspension linkage suspending the seat link from the carrier link for pivotal movement relative to the carrier link, and a mounting linkage pivotally mounting said carrier link relative to the base; a backrest, backrest linkage means pivotally mounting the backrest relative to the seat for movement between a substantially upright position and a number of reclining positions; a footrest, footrest linkage means mounting the footrest relative to the seat for movement between a retracted position adjacent the seat and an extended position projected forwardly from the seat, footrest actuating linkage means independent of the backrest for moving the footrest linkage means to position the footrest in said retracted or extended positions; and an actuating and control linkage interconnecting the footrest actuating linkage means and the mounting linkage for moving the mounting linkage forwardly relative to the base when the footrest is moved to said extended position.

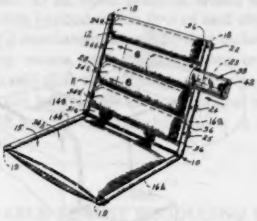
4,108,492

BACK SUPPORT

Billy E. Kirby, 938 Vinecrest La., Richardson, Tex. 75080

Filed Oct. 18, 1974, Ser. No. 515,986
Int. Cl.[2] A47C 7/46, 27/10
U.S. Cl. 297—284 **1 Claim**

1. A back support comprising: a pair of horizontally spaced vertically extending frame members; vertically spaced horizontally extending frame members; means securing ends of said horizontally extending frame members to said vertically extending frame members; flexible front and rear panels secured together adjacent three edges to form a hollow slip cover having an open end; pockets secured to said front panel of the slip cover forming spaced horizontally extending compartments, each of said compartments being isolated one from the other, said slip cover being positioned over said vertically



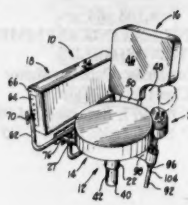
extending frame members such that each of said horizontally extending frame members is positioned adjacent to and parallel with one of said compartments; an inflatable cushion in each of said compartments; means on each cushion to vary pressure in each cushion independently of pressure in the other cushions; a seat cushion in said slip cover adjacent the open end thereof.

4,108,493

LOCOMOTIVE CAB SEAT

Glen L. Naus, Rte. 3, Holiday Lake, Willard, Ohio 44890

Filed Mar. 10, 1977, Ser. No. 776,285
Int. Cl.[2] A47C 3/18, 7/54
U.S. Cl. 297—337 **3 Claims**



1. In a locomotive cab seat assembly including a rotatable seat portion and a backrest, the seat portion being mounted for rotation independently of the backrest and the backrest being shaped to permit an operator to rotate the seat portion to a sideways-facing position with respect to the backrest, the improvement comprising:

(a) a vertically movable armrest movable between a raised position for supporting an arm of the operator when the operator is facing forwardly and a lowered position for permitting the operator to rotate the seat portion to the sideways-facing position;

(b) support means for supporting the armrest independently of the seat portion so that the seat portion can rotate while the armrest is stationary, the support means including cooperating structure for releasably holding the armrest in the raised position, the cooperating structure being releasable by the operator so that the armrest can be moved to the lowered position;

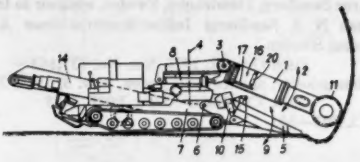
(c) a second armrest disposed adjacent the seat portion, the second armrest having an upper, arm-supporting surface and a side surface extending from the upper surface to near the seat portion so that the side surface supports the operator's back when the operator is in the sideways-facing position; and

(d) support means for adjustably supporting the second armrest independently of the seat portion, whereby the seat portion can rotate while the second armrest is stationary.

4,108,494
CUTTING MACHINE

Peter Kogler, Knittelfeld, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Austria

Filed May 13, 1977, Ser. No. 796,705
Claims priority, application Austria, May 13, 1976, 3504/76
Int. Cl.[2] E21C *27/20*
U.S. Cl. 299—1 **6 Claims**



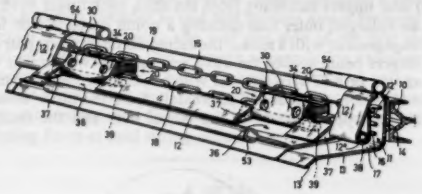
1. A cutting machine having a frame on which a cutting arm is attached, said cutting arm including at least one cutting head which can be swiveled around a horizontal axis and a vertical axis, a loading ramp pivotally attached to said frame and disposed below said cutting arm so that it can be swiveled around a horizontal axis, first hydraulic drive means for effecting the lifting and lowering of said cutting arm, second hydraulic drive means for moving said loading ramp and stopping means responsive to changes in the relative vertical distance between said cutting arm and said loading ramp for stopping further movement of said cutting arm and said loading ramp toward one another when the vertical distance between said cutting arm and said loading ramp does not exceed a first predetermined distance, said stop means including a first and second stop member respectively mounted on said cutting arm and said loading ramp so as to come into engagement with one another as said cutting arm and said loading ramp are pivoted toward one another, at least one of said first and second stop members being movably mounted, said movably mounted stop member including a pivotally mounted elongated actuating member and valve means for relieving pressure in said first and second hydraulic drive means in response to movement of said movable stop member when said first predetermined distance is not exceeded, and the other of said stop members includes an elongated member for mating with the elongated actuating member in said movable stop member, said stop means including two pairs of said first and second stop members said pairs being respectively mounted on opposite sides of said cutting arm and said loading ramp so that as said cutting arm traverses back and forth over said loading ramp the elongated member of one of the two pairs of stop members will abut if said first predetermined distance is not exceeded.

4,108,495
GUIDES FOR MINERAL MINING MACHINES

Alois Hauschopp, Werne, and Wolfgang Peters, Selm, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 23, 1977, Ser. No. 771,266
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1976, 2607350
Int. Cl.[2] E21C *35/20*
U.S. Cl. 299—43 **18 Claims**

1. In a guide for a mineral mining machine, said guide having means defining upper and lower chain guide passages along which a drive chain for the machine is circulated, cover plates covering the guide passages, and means pivotably mounting the cover plates to permit them to be swung outwards for access to the guide passages, the improvement therein comprising: the defining means including a plurality of separate spacers vertically separating the guide passages, the pivot mounting means taking the form of hinge connections pivoting the cover plates to said spacers, and the cover plates having recesses for

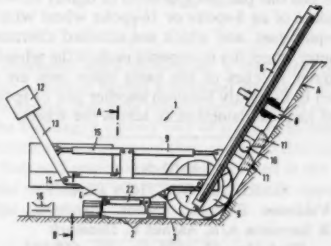


accepting said spacers, the cover plates and said spacers combining to form a continuous ramp-like guide surface.

4,108,496
PADDLE WHEEL PICK-UP

Ernst-Otto Schneidersmann, Duisburg, Germany, assignor to DEMAG Aktiengesellschaft, Duisburg, Germany

Filed Jun. 17, 1977, Ser. No. 807,442
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1976, 2628863
Int. Cl.[2] E21C *27/24, 35/20*
U.S. Cl. 299—45 **7 Claims**



1. A material mining and removal apparatus comprising
(a) a movable carriage;
(b) a frame disposed on said carriage;
(c) a rotatable pick-up wheel mounted on said frame and extending laterally to one side of said carriage toward a surface to be mined and engaging the mine floor; the improvement characterized by
(d) a cutter supporting beam pivotally mounted on said frame adjacent said pick-up wheel and extending laterally toward said surface to be mined;
(e) reversible power means disposed between said carriage and said supporting beam for pivoting said beam into position parallel to a surface to be mined;
(f) a cutting device mounted on said supporting beam; and
(g) power means on said cutting device for moving said cutting device along said beam toward and away from the supporting surface of said carriage and along said surface to be mined;
(h) whereby material removed from a mining surface by said cutter falls into the path of said rotatable pick-up wheel.

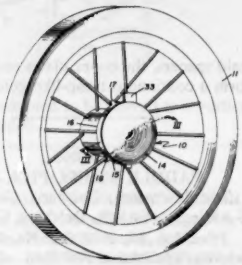
4,108,497
HUB CAP

Bruce N. Smith, Seabrook, N.H., assignor to Spherex, Inc., Seabrook, N.H.

Filed Dec. 29, 1976, Ser. No. 755,163
Int. Cl.[2] B60B *7/06*
U.S. Cl. 301—37 SA **5 Claims**

1. Hub cap for use on a wheel having a plurality of spokes extending radially from a central hub, comprising

(a) a circular main body,
(b) a skirt extending from the periphery of the main body, and
(c) four fingers extending from the skirt, each finger having an enlarged outer end defining a notch on each side for engagement with a spoke, the facing notches of one pair of fingers being spaced for close engagement with a pair of spokes of a 12-spoke wheel which spokes are equidistant, and which are attached alternately from the outer wheel rim to opposite ends of the wheel hub, and the facing



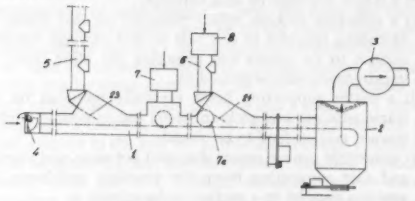
notches of the other pair are similarly spaced for engagement with another pair of spokes of the wheel located in a diametrically-located position, while the outer notches of the said one pair are spaced to fit tightly between a pair of spokes of an 8-spoke or 16-spoke wheel which spokes are equidistant, and which are attached alternately from the outer wheel rim to opposite ends of the wheel hub, and the outer notches of the same other pair are similarly spaced to fit tightly between another pair of spokes of the wheel located diametrically across the wheel.

4,108,498

GARBAGE SUCTION PLANT

Thomas Valdemar Bentsen, Aarhus, Denmark, assignor to Bruun & Sorensen A/S, Aarhus C, Denmark

Filed Mar. 22, 1976, Ser. No. 668,982
Claims priority, application Denmark, Mar. 21, 1975, 1224/75
Int. Cl.[2] B65G *53/06*
U.S. Cl. 302—27 **5 Claims**



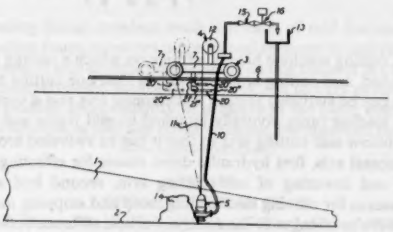
1. A garbage suction plant using an air suction system and having a number of garbage chutes connected to a common, substantially horizontal transport duct leading to a collecting centre having air suction equipment for creating a suction effect through the duct and the chutes, a plurality of air inlet valve arrangements being provided at predetermined locations of the duct which are situated further away from the collecting centre than connection points of at least some of the garbage chutes, each of said valve arrangements being adapted for opening under the influence of the suction effect in the transport duct and subsequent closing after a predetermined period of time, each of said plurality of air inlet valve arrangements comprising two interconnected valve plates each adapted for closing an opening communicating with said air-suction system, and means for resiliently urging a first of said valve plates against an inner wall surface surrounding said opening, a second of said valve plates being adapted for being urged against an outer wall surface surrounding said opening under influence of said air suction, said valve arrangement being further connected to damping means adapted for determining said predetermined time between opening said first valve plate and closing said second valve plate against the wall opening.

4,108,499

METHOD AND CONTROL SYSTEM FOR CONTROLLING A SUSPENDED IMPLEMENT

Nils Arne Sandberg, Hassleholm, Sweden, assignor to Ingenjorsfirman N A Sandbergs Industrikonstruktioner AB, Hassleholm, Sweden

Filed Oct. 29, 1976, Ser. No. 737,163
Claims priority, application Sweden, Nov. 3, 1975, 75122655
Int. Cl.[2] B65G *53/04*; E02F *3/88*
U.S. Cl. 302—34 **7 Claims**



1. Apparatus for controlling the position of a suspended travelling implement in relation to a carriage above and solely supporting said implement through a wire comprising:
conduit means connecting said implement to a receiving means for conveying material thereto;
a flow rate sensor disposed in said conduit which monitors the flow rate of the conveyed material;
first means responsive to said flow rate sensor which alters the length of wire between said carriage and said implement to maintain said flow rate within preset limits so as to compensate for varying density strata of material to be conveyed;
second means for both moving said carriage and therefore said implement along within a certain velocity range;
third means for measuring a lag between said implement and said carriage;
and fourth means for adjusting the velocity of said carriage when said third means measures a lag between said implement and said carriage by an angle said wire defines relative to absolute vertical.

4,108,500

PROCESS AND EQUIPMENT FOR EFFECTING SAVINGS IN COMPRESSED GASES DURING INJECTION OF SOLIDS BY MEANS OF PNEUMATIC CONVEYORS

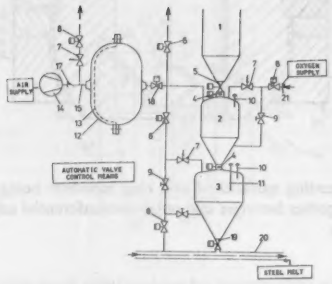
Walter Stamer, Hamburg, Germany, assignor to Claudius Peters AG and Maxpeters Gesellschaft fuer Verfahrenstechnik mbH, Hamburg, Germany

Filed Aug. 31, 1976, Ser. No. 719,169
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1975, 2538785
Int. Cl.[2] B65G *53/40*
U.S. Cl. 302—53 **11 Claims**

1. A process of saving gas in the pneumatic injection of particulate solids into a blow line connected with a second container pressurized with the gas, comprising the steps of:
charging the solids in discrete batches into a first pressurizable container:
pressurizing the first container from a reservoir of the com-

pressed gas, while a previous batch of said solids is being injected into the blow line from the second container:

charging the batch of pressurized solids in first container into the second container by connecting the containers to equalize the pressure therebetween, while solids in the second container are being continuously discharged under pressure into the blow line:



cutting off connection between the containers on completion of discharge of an accumulated batch of solids from the first to the second container and subsequently

connecting the first container with the reservoir to pass gas thereto for subsequently pressurizing the first container.

4,108,501

BRAKE ACCELERATOR FOR AIR BRAKE SYSTEM OF A RAILWAY VEHICLE

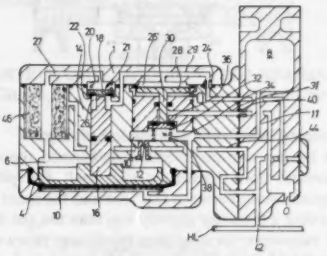
Josef Hintner, and Peter Pick, both of Münich, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,745

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638437

Int. Cl.² B60T *17/04*

U.S. Cl. 303—82 **5 Claims**



1. A brake accelerator for drawing off air from the brake line of an air brake system for railway vehicles and comprising a first piston having one side subjected to air pressure in a brake line, means including an expansion chamber connected to the other side of said first piston for subjecting said other side to a control pressure opposing the brake line pressure, there being a throttle opening between said one side of the first piston and the connection from said expansion chamber to said other side of the first piston, first passage means having a second throttle opening therein for connecting said one side of the first piston to the atmosphere, a first valve closing said first passage means, means on said first piston for opening said first valve when the control pressure on the other side of the first piston predominates over the brake line pressure on said one side of the piston, second passage means including a third throttle opening for connecting said expansion chamber to the atmosphere, a second valve closing said second passage means and spring means urging said second valve into the closed position, a pressure accumulation chamber in said first passage means between said second throttle opening and said one side of the first piston, and second piston in said pressure accumulation chamber and having means thereon for actuating said second valve, said second piston acted upon by pressure in said pressure accumulation chamber in a direction to open said valve against the closing force of said spring means.

4,108,502

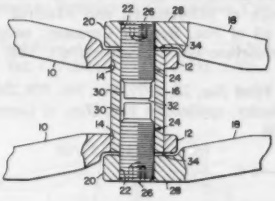
JOINT ASSEMBLY FOR LINKS OF ENDLESS TRACK

William Paul Wohlford, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 28, 1977, Ser. No. 772,690

Int. Cl.² B62D *55/20*

U.S. Cl. 305—14 **1 Claim**



1. An improved track section for a track laying tractor, comprising: a bushing having a threaded interior; a first pair of track links having first ends respectively received on opposite ends of the bushing; a second pair of track links respectively having threaded bores in one of their ends; and first and second threaded fasteners respectively being received in the threaded bores of the second pair of track links and in the opposite ends of bushing.

4,108,503

LINEAR MOTION BALL BEARING

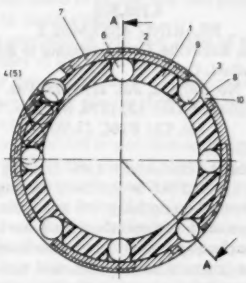
Horst Manfred Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed Mar. 21, 1977, Ser. No. 779,692

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612936

Int. Cl.² F16C *31/06*

U.S. Cl. 308—6 C **4 Claims**



1. In a linear motion ball bearing operable with a shaft, the bearing including an outer sleeve, a ball retaining cage situated within the sleeve, the cage having a plurality of continuous

raceways each of which comprises axial loaded and unloaded return races, and curved turn-around races connecting the adjacent ends of said axial races, and a plurality of balls substantially filling said raceways, the sleeve including in the region of each of said unloaded return races a slot extending axially and radially through the sleeve, said slot defined by spaced edges, the improvement in combination therewith wherein said slot has a width at least equal to the diameter of said balls, and said cage and sleeve are relatively rotated about their common longitudinal axis such that balls in said unloaded return race of the cage are engaged by only one edge of said slot which thereby defines with said unloaded return race a space having a width less than said ball diameter, whereby said balls are prevented from falling out of said unloaded return portion of said raceway.

4,108,504

RACEWAY FOR LONGITUDINALLY MOVABLE ROLLING ELEMENT BUSHING

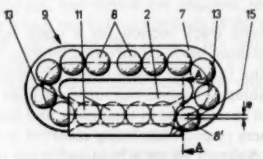
Horst Manfred Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,209

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631808

Int. Cl.² F16C *29/06*

U.S. Cl. 308—6 C **6 Claims**



1. In a bushing adapted for linear movement and including housing means defining at least one path for guiding rolling elements, wherein said path has a raceway portion along which said rolling elements are exposed to loads and a return raceway portion for unloaded rolling elements and joining both ends of said loaded raceway portion, the improvement wherein the ends of said loaded raceway portion have gradually increasing widths away from the longitudinal center portion thereof, but have the same depth, whereby rolling elements entering said loaded raceway portion are subjected to loading prior to being guided laterally by the side walls of said loaded raceway portion.

4,108,505

BEARING ASSEMBLY

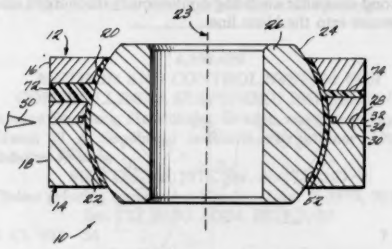
Stanley S. Orkin, Rockville, Conn., assignor to Kamatics Corporation, Bloomfield, Conn.

Division of Ser. No. 597,632, Jul. 21, 1975, Pat. No. 4,033,019. This application Oct. 12, 1976, Ser. No. 731,816

Int. Cl.² F16C *23/00*

U.S. Cl. 308—72 **1 Claim**

1. An outer bearing element for a self-aligning bearing of the type having a truncated ball as the inner bearing element, said outer bearing element comprising first and second hemispherical ring members, said ring members each having a generally planar mating surface and inner annular surfaces that are symmetrical about a common central axis, said mating surfaces of said ring members being placed in abutting relationship, each of said mating surfaces having inner and outer circumferential edges between which a said mating surface extends, one of said ring members having an annular lip adjacent said respective inner circumferential edge, said other of said ring members having an annular recess adjacent said respective inner circumferential edge, with said lip extending into said recess to define a closed, circumferential cavity about said common central



axis, said mating surfaces of said ring members being fusion-bonded together between said outer circumferential edges and said cavity.

4,108,506

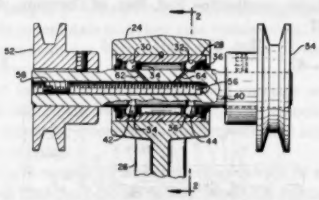
BEARING LUBRICATING SYSTEM

Norbert Osborn, Irving, Tex., assignor to WRR Industries, Inc., Dallas, Tex.

Filed Oct. 26, 1976, Ser. No. 735,267

Int. Cl.² F16C *1/24*

U.S. Cl. 308—187 **8 Claims**



5. A bearing lubricating system comprising:

a shaft having two inner raceways formed therearound, a concentric bore formed in said shaft and passageways communicating between the bore and the inner raceways,

balls having a diameter slightly less than the arc diameter of said raceways for tracking the inner raceway formed around said shaft,

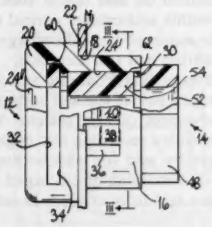
an outer ring having two outer raceways formed therein, the outer raceways in said outer ring having a separation different from the separation between the inner raceways in said shaft such that the balls contact the inner and outer raceways at an angle to a plane perpendicular to the axis of the bearing and where said balls contact the inner raceways on the sides of the inner raceways removed from the points of communication of the passageways between the bore and the inner raceways to prevent the balls from tracking over the opening of the passageways into the inner raceways, and

means for selectively forcing lubricant loaded in the bore through the passageways to the inner raceways where the lubricant lubricates the bearing.

4,108,507
THROUGH-WALL CABLE SUPPORT

Wolf Renner, Giessen, and Dieter Mauer, Lollar, both of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Dec. 7, 1976, Ser. No. 748,200
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556878; Dec. 17, 1975, 7540233[U]
Int. Cl.[2] F16C 27/00
U.S. Cl. 308—238 8 Claims

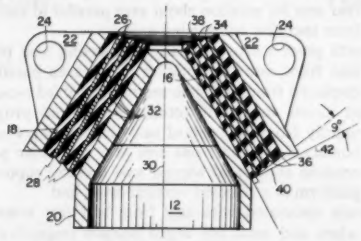


1. A cable strain relief bushing for insertion into a non-circular opening forming in a panel, comprising; a body having an outer surface which in cross section forms a shape complementary to the panel opening, an enlarged head located at one end of said body to engage one side of the panel, and having retaining means disposed on said body outer surface to engage the opposite side of said panel, said body further having a non-circular bore formed therethrough, and a locking member having wall structure defining a bore therethrough for receiving a cable, said member having at least one movable finger hingedly supported adjacent an opening formed through said locking member wall structure for movement of said finger into said locking member bore through said opening, said body non-circular bore having a minimum cross-section dimension and a maximum cross-sectional dimension and said finger extending from said locking member wall structure to define a maximum cross-sectional dimension of said locking member less than said body member bore maximum cross-section and greater than said body member bore minimum cross-section, whereby rotation of said locking member inserted into said body bore is effective to move said finger through said wall structure opening to contact and grip a cable disposed in said locking member bore.

4,108,508
FRUSTROCONICAL LAMINATED BEARING

Ralph L. Clinard, Jr., Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 1, 1977, Ser. No. 764,667
Int. Cl.[2] F16F 1/38
U.S. Cl. 308—238 6 Claims

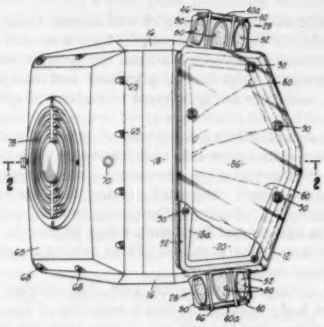


1. A laminated bearing comprising a plurality of alternating and bonded together layers of elastomeric material and substantially inextensible material, each of the layers being a frustroconically shaped annulus that has a pair of frustroconical shaped side surfaces and is concentrically disposed about a common axis extending lengthwise of the bearing, the side surfaces of adjacent layers being juxtaposed with and bonded to each other such that the larger diameter end of each layer is disposed adjacent to the larger diameter end of another layer and said larger diameter ends of the layers together define an annular surface of the bearing, said annular surface of the bearing in radial section defining an angle of about 9° with respect to a line which is normal to a frustroconical side surface of a layer, the annular bearing surface being angled with respect to said normal line in a direction toward the smaller diameter ends of the layers with increasing distance along said normal line away from the common axis.

4,108,509
CONTROLLED ENVIRONMENT WORK ENCLOSURE

Meyer Piet, Arcadia, and Dean Gaylord Giles, Valinda, both of Calif., assignors to Futurecraft Corporation, City of Industry, Calif.

Filed Mar. 18, 1977, Ser. No. 779,013
Int. Cl.[2] B01D 53/34; B01L 1/00
U.S. Cl. 312—1 8 Claims



1. A work enclosure for use in dental operatories to enclose an amalgamator within a controlled atmosphere, comprising:

(a) interconnected front, back, side, bottom, and top walls defining an enclosed work space, said back wall having a forwardly sloping portion and said top wall having a removable viewing panel provided therein;

(b) a mercury collection sump formed in said bottom wall, said bottom wall being configured to slope downwardly from said front, back, and side walls toward said sump;

(c) glove means replaceably mounted on said front wall for receiving the hands of an operator and permitting manipulation of the amalgamator;

(d) air inlets provided in said side walls of said housing on opposite sides of the work space;

(e) first filter means cooperatively associated with said air inlets for preventing passage therethrough of dust or other particulate material;

(f) an air outlet provided in said forwardly sloping portion of said back wall rearwardly and above the work space;

(g) a motorized suction fan carried by said back wall proximate said air outlet for maintaining subatmospheric pressure in said work enclosure and for drawing a stream of air inwardly from said air inlets through said work space and upwardly and rearwardly toward said air outlet; and

(h) second filter means interposed in said stream of air between said work space and said fan for preventing mercury in vapor form contained therein from escaping from said work enclosure through said air outlet.

4,108,510

RECORD PLAYER CABINET

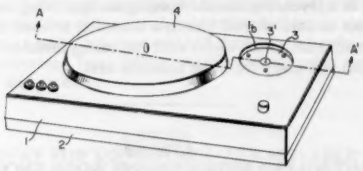
Koichi Iimura, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,211

Claims priority, application Japan, Mar. 19, 1976, 51-34024[U]

Int. Cl.[2] A47B *81/06*; G11B *3/10*

U.S. Cl. 312—8 **6 Claims**



1. A cabinet for a record player comprising

a cabinet body being composed of a rigid material having a vibration attenuation rate characteristic such that a majority of the vibration attenuation rates in a first frequency range are generally greater than those in a second frequency range higher than that of said first frequency range,

a base adhered to the bottom of said cabinet body,

a plate adapted for attachment of a tone arm, said base and plate materials are selected from the group consisting of homogenized chip board, plywood and non-laminated wood, said plate being adhered to the top of said cabinet body,

said base and plate being composed of rigid materials having vibration attenuation rate characteristics such that a majority of the vibration attenuation rates thereof in said second frequency range are greater than the respective corresponding vibration attenuation rates of said cabinet body in said second frequency range to thereby enhance the resonance characteristic of said cabinet in said second frequency range, and

the said vibration attenuation rate characteristic of said cabinet body being such that a majority of the vibration attenuation rates thereof are greater than the respective corresponding vibration attenuation rates of said plate and base in said first frequency range to thereby lessen the tendency for howling to occur.

4,108,511

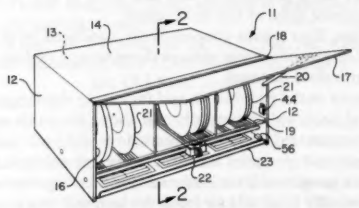
MODULAR RECORD SELECTOR AND STORAGE APPARATUS

Martin Alfred Spragg, Jr., 422 Wildcroft Dr., Martinez, Calif. 94553

Filed Mar. 23, 1977, Ser. No. 780,462

Int. Cl.[2] A47B *81/06*

U.S. Cl. 312—9 **17 Claims**



1. A storage enclosure for recording discs comprising:

a cabinet having two side walls, a rear wall, and a top wall,

a front cover disposed in a front opening opposite said rear wall disposed for movement between an open position exposing the interior of said cabinet and a closed position closing said front opening, said top wall having

a plurality of top grooves on the underside thereof running in a front and rear direction,

a lower platform spaced from said top wall extending between said two side walls and having a plurality of bottom grooves therein facing and each being substantially aligned vertically with one of said top grooves,

lateral slide means extending between said two end walls normal to said grooves,

a carriage mounted on said lateral slide means for lateral movement within said cabinet normal to said grooves,

a selector slide mounted on said carriage for sliding movement in said front and rear direction,

a selector arm extending from said selector slide, whereby alignment with a pair of top and bottom grooves and rear to front movement of said selector slide engages said selector arm with a recording disc engaged at the top and bottom edges by said top and bottom grooves respectively, and the recording disc is urged through said front opening when said front cover is in said open position.

4,108,512

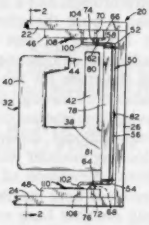
CABINET MOUNTING UNIT FOR FREE ARM SEWING MACHINE

Eugene M. White, 1624 Franklin Ave., Fort Wayne, Ind. 46808

Filed Jun. 20, 1977, Ser. No. 808,099

Int. Cl.[2] A47B *81/00*

U.S. Cl. 312—24 **8 Claims**



1. A cabinet mounting unit for free arm sewing machines comprising:

a frame having a pair of opposite side members,

a rear pivot arm,

first pivot means pivotally connecting said rear arm to one of said side members for rotation about a first axis,

a front pivot arm,

second pivot means pivotally connecting said front arm to one of said side members for rotation about a second axis parallel to and displaced from said first axis,

a sewing machine mounting platform,

third pivot means pivotally connecting said platform to said rear arm for rotation about axes parallel to and displaced from said first and second axes,

fourth pivot means pivotally connecting said platform to said front arm for rotation about axes parallel to and displaced from said first, second and third axes,

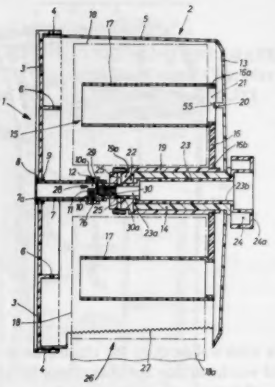
stop means stationarily connected to and projecting inwardly from said one of said side members so as to be contacted by said front arm at a particular point in its rotation about said second axis thereby supporting said platform at a selected vertical level, and

means associated with said front and rear arms whereby when said arms are urged toward respective positions which are coplanar, said arms undergo a binding action whereby said front arm is pulled inwardly away from said one of said side members so as to clear said stop means and permit said platform to be lowered below said selected vertical level.

4,108,513
PAPER DISPENSER, ESPECIALLY TOILET PAPER DISPENSER

Lars Bengt Lander, Zug, Switzerland, assignor to Cepasy AG, Zug, Switzerland

Filed Mar. 25, 1977, Ser. No. 782,262
Claims priority, application Switzerland, Dec. 17, 1976, 15935/76
Int. Cl.[2] B65H *19/00*
U.S. Cl. 312—39 6 Claims

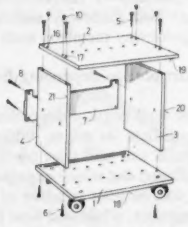


1. A paper dispenser for dispensing a web of paper from a paper roll, comprising:
- a housing for accommodating therein a plurality of paper rolls;
- said housing being provided with an outlet opening for dispensing a paper web withdrawn from its associated roll;
- means defining a tear-off edge provided for the housing at the region of the outlet opening for tearing-off a desired length of the paper web to be withdrawn out of the housing;
- paper roll-support means arranged in said housing for supporting at least two separate paper rolls; and
- means for selectively placing each of the paper rolls into a withdrawal position in front of said outlet opening.

4,108,514
PHONOSTAND

Heinrich Zimmerman, St. Georgen, Schwarzwald, Fed. Rep. of Germany, assignor to Dual Gebrüder Steidinger, St. Georgen, Schwarzwald, Fed. Rep. of Germany

Filed Oct. 18, 1977, Ser. No. 843,432
Int. Cl.[2] A47B *53/00, 87/00*
U.S. Cl. 312—107 5 Claims

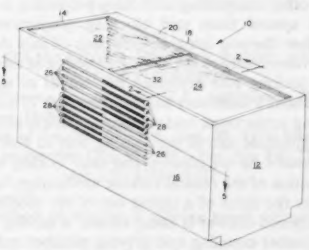


1. A stand for the insertion and setting up, respectively, of electro-acoustic devices of general use, comprising
- a bottom plate,
- a first cover plate spaced apart from said bottom plate,
- two first side walls spaced apart from one another having end face sides disposed abuttingly between said bottom plate and said first cover plate, said two first side walls also having rear end face sides,
- first screw means for screwing said bottom plate and said first cover plate onto said end face sides of said two first side walls and forming a base element therewith,
- a reinforcement member comprising a plate-shaped plastic molded part having and covering only a portion of the total height of said first side walls disposed against said rear end face sides of said two first side walls,
- second screw means for screwing said reinforcement member onto said rear end face sides of both of said two first side walls,
- two second side walls having upper end face sides, back end face sides and lower end face sides,
- a second cover plate of the same width as that of said first cover plate,
- third screw means for screwing said second cover plate on said upper end face sides of both of said two second side walls and forming therewith an assembly element having dimensions substantially corresponding to that of a conventional phonotable,
- a second reinforcement member identical to said first-mentioned reinforcement member, said second reinforcement member having a lowermost projecting section,
- fourth screw means for screwing said second reinforcement member on said back end face sides of both of said two second side walls in a position with said projecting section of said second reinforcement member projecting downwardly beyond said two second side walls,
- said assembly element being mountable on said base element with said lower end face sides of said two second side walls abutting on said first cover plate,
- fixing means cooperatively arranged between both of said second side walls of said assembly element and said first cover plate of said base element for bringing said two first side walls and said two second side walls of said base element and said assembly element, respectively, in corresponding alignment coincidence, respectively, upon mounting of said assembly element on said base element,
- fifth screw means for screwing said projecting section of said second reinforcement member of said assembly element with said base element, the latter disposed under said assembly element.

4,108,515
DISPLAY CASE

Raymond M. Johnson, 1029 Donaldson Ave., San Antonio, Tex. 78228

Filed Oct. 12, 1976, Ser. No. 731,311
Int. Cl.[2] A47F *3/14*
U.S. Cl. 312—119 6 Claims



1. A display case comprising:
- an enclosed rectangular structure having connected outer walls;
- a first of said outer walls being of transparent material removably secured to adjacent walls;

a plurality of trays inside of said enclosed structure parallel to said first outer wall, said trays being slidably carried by parallel supports of a second and third wall, said second and third walls being parallel to each other, but both being perpendicular and adjacent to said first wall;

shaft means connected to each of said trays, said shaft means extending through slot means parallel to said trays in at least one of said second and third walls to a point outside said enclosed structure, said shaft means being slidably movable along said slot means to move said trays for viewing through said first wall;

said parallel supports including groove means in said second and third walls, said slot means being connected to said groove means with said shaft means extending therethrough;

slidable bar means in said groove means, said slidable bar means being carried by said shaft means to cover said slot means; and

roller means attached to said trays for ease of movement of said trays along said groove means.

4,108,516

CENTRAL LOCKING MECHANISM

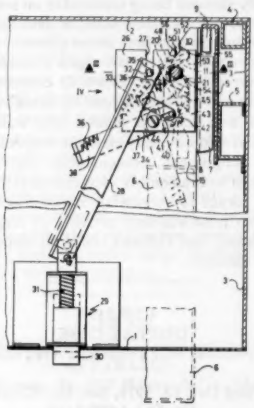
Eugen Scholl, Gaildorf-Adelbach, Fed. Rep. of Germany, assignor to Wilhelm Bott KG, Gaildorf, Fed. Rep. of Germany

Filed Oct. 7, 1976, Ser. No. 730,470

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1975, 2544994

Int. Cl.[2] E05B 65/46

U.S. Cl. 312—216 **5 Claims**



1. A central locking mechanism for an item of furniture having a plurality of drawers arranged side by side or one above the other comprising a blocking projection and a second projection spaced from said blocking projection having a stopping face thereon integral with each of said drawers and arranged transversely to the sliding direction of the respective drawer, a locking bolt extending beyond all of said drawers pivotable about a stationary axis into the path of movement of the blocking projections, said stationary axis extending parallel to the longitudinal axis of the locking bolt so that the closed drawers cannot be withdrawn and said locking bolt, in the locked position of the central locking mechanism, being pivotable against the force of a spring out of the blocked position when an opened drawer is being closed, a driving member, a bistable member coupling said driving member and said locking bolt, said locking bolt being connected to a lever arm which, in the unlocking position of the locking bolt, projects into the path of said stopping face so that the stopping face is engageable with the lever arm when opening a drawer and the locking bolt is pivotable into the locking position.

4,108,517

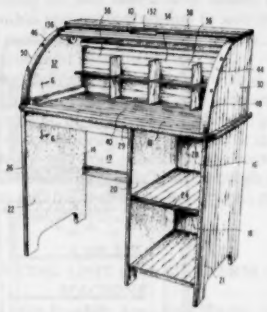
CHILD'S DESK WITH SLIDE-DOOR AND GUIDEWAY THEREFOR

William R. Tomalinas, Jr., Wapwallopen, and Herbert S. Gurbst, Kingston, both of Pa., assignors to Roth American, Inc., Wilkes-Barre, Pa.

Filed May 24, 1977, Ser. No. 799,975

Int. Cl.[2] E06B 9/14

U.S. Cl. 312—297 **2 Claims**



1. A desk with a slide-door for closing an access opening to a horizontal work surface member comprising:

a horizontal work surface member;

a supporting base for supporting said work surface member providing a plurality of compartments below said work surface member;

a rear casing member disposed above the work surface member and having pigeonholes therein;

parallel side members attached to said rear casing member and disposed perpendicularly to the horizontal work surface member, said side members having symmetrical arcuate edge portions, said casing member and said side members defining an access opening to said horizontal work surface;

a first attachment strip secured to one of said parallel side members;

a second attachment strip secured to a vertical wall of said supporting base, said horizontal work surface member being sandwiched between said attachment strips and attached thereto by bolts inserted through the attachment strips and the working surface member;

a slide-door for closing the access opening to the horizontal work surface member including a plurality of elongated slats, disposed so that their longitudinal edges are parallel, said slats being articulated to one another by a flexible backing sheet attached to a longitudinal face of each of the slats; and,

elongated guideway members disposed along the arcuate edge portions of the side members and fastened to the side members by a plurality of fasteners, inserted at spaced intervals through said guideway members into said side members, said guideway members each consisting of:

a base portion;

an elongated skirt portion depending from said base portion;

a first elongated wall portion depending from said base portion intermediate its edges, which, together with said base portion and said skirt portion defines a first, generally U-shaped slot which engages the arcuate edge portion of a side member to serve as an edge molding for the side member, while said base portion remains in a generally perpendicular orientation with respect to said side member; and,

a second elongated wall portion extending from said first wall portion, generally parallel to said base portion, which, together with said first wall portion and said

base portion defines a second, laterally opening U-shaped slot for receiving and slidably engaging ends of said slats

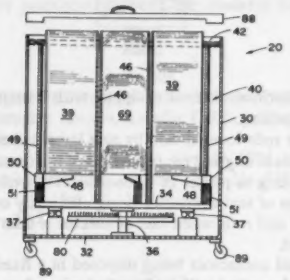
wherein said guideway members are formed of flexible plastic and wherein said guideway members are attached to the arcuate edge portions of the side members with fasteners inserted at intervals through the base portions of the plastic guideway members into the arcuate edge portions so that the guideway members conform to the shapes of the arcuate edge portions of the side members.

4,108,518

BANQUET FOOD SERVING APPARATUS

Edy P. Angst, 3737 Woodside Dr., Carson City, Nev. 89741

Filed Mar. 31, 1977, Ser. No. 783,211
Int. Cl.² A47B *85/00*
U.S. Cl. 312—305 **10 Claims**



1. Banquet food serving apparatus comprising:

a. a hollow tubular housing closed at one end and having sufficient volume to contain a substantial quantity of food serving plates in a plurality of vertical stacks, said housing being adapted to be supported at said closed end thereof with its axis extending vertically;

b. a turntable mounted within said housing at the closed end thereof for rotation about said vertical axis of said housing;

c. a plurality of support means mounted on said turntable, each of said support means being adapted to support a vertical stack of food serving plates within said housing and including means for selectively moving the one of said vertical stacks of food serving plates supported thereby along said vertical axis of said housing; and

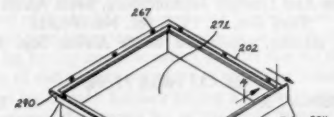
d. drive means for rotating said turntable about said vertical axis of said housing.

4,108,519

PULL TRAY

Robert A. Chervenak, Seattle, Wash., assignor to Comerco, Inc., Tacoma, Wash.

Filed Apr. 27, 1977, Ser. No. 791,315
Int. Cl.² A47B *95/02*
U.S. Cl. 312—320 **15 Claims**



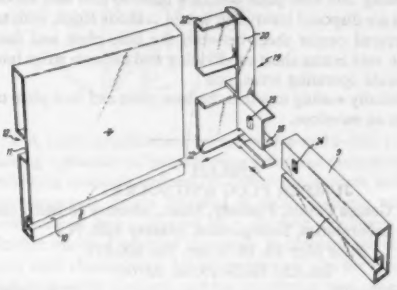
1. A pull tray comprising a horizontal support means adapted to provide support to a plurality of articles, a pair of horizontally extending glide surface means adapted to support said support means within a cabinet and facilitate removal of said pull tray from said cabinet, a front vertically extending flat piece interconnected between said horizontally extending pair of glide surfaces, said front flat piece defining a pair of shoulders at the extreme edges of said front flat piece, a resilient retention means forwardly protruding from said plan flat surface, said shoulders and retention means being adapted to facilitate the selective securing and removal of handle means, said handle means having channel means adapted to slide over said shoulders and when secured to said flat front piece serving to convert said pull tray into a drawer with associated selectively removal handle means.

4,108,520

DRAWERS

Leon George Litchfield, Belper, England, assignor to L. B. (Plastics) Limited, Derby, England

Filed Sep. 15, 1976, Ser. No. 723,499
Claims priority, application United Kingdom, Sep. 17, 1975, 38162/75
Int. Cl.² A47B *47/00*
U.S. Cl. 312—330 R **5 Claims**



1. A drawer construction having front and side walls formed from hollow extruded panels, each panel having at least one box-like section with open ends, the panels being interconnected by corner components each of which comprises a cornerpost having locating members projecting therefrom at right angles to one another and engaged in the open ends of the respective box-like sections, and projecting detents carried on the locating members so as to be depressed when the locating members are inserted to spring out into engagement with apertures in the panels when the locating members are pushed home, the detents on each locating member which engages the front panel being located on the side toward the inside of the drawer so that such detents are not visible when the drawer is viewed from the front.

4,108,521

METHOD OF MAKING A DISPLAY PANEL AND THE ANODES THEREFOR

Daniel P. Wicher, Jr., Newton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 718,795, Aug. 30, 1976, abandoned.
This application Oct. 17, 1977, Ser. No. 842,735
Int. Cl.² H01J *9/02*
U.S. Cl. 316—17 **6 Claims**

1. The method of making a display panel comprising the steps of

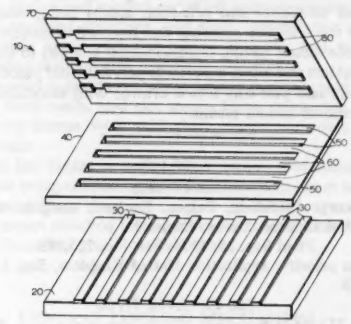
forming a plurality of parallel cathode strip electrodes on an insulating base plate,

forming conductive runs on a glass face plate, said runs being thin, parallel conductive lines,

screening an organo-metallic substance on said face plate in

a pattern of parallel lines, each line being in contact with one of said conductive runs,

baking said face plate to remove organic substances therefrom and to leave the metallic portion of said substance in said pattern as transparent anode lines which are in contact with said conductive runs,



assembling said base plate and face plate so that said anode lines are disposed transverse to said cathode strips, with an apertured center sheet between the base plate and face plate, said center sheet subdividing said cathode strips into separate operating areas, and

hermetically sealing together the base plate and face plate to form an envelope.

4,108,522

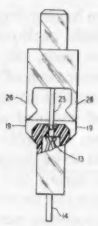
JUMPER PLUG AND SOCKET

Anthony George Favale, Peabody, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1977, Ser. No. 800,079

Int. Cl.² H01R *29/00, 31/08*

U.S. Cl. 339—19 **9 Claims**



1. In combination, a socket comprising an insulating body having a row of holes extending through said body from top to bottom for receiving terminals therein, a pair of shoulders extending along opposite sides of said socket body, parallel to said row of holes, increasing the width of said body in the area of said shoulders, and at least one pair of opposing projections extending beyond the width of said shoulders and dividing said row of holes into sections, and a plurality of first terminals retained in selected holes of said row of holes; and at least one jumper plug for selectively connecting adjacent first terminals comprising an insulating plug body, a pair of interconnected second terminals for mating with said first terminals, said second terminals retained in said plug body and projecting from one end thereof, and a pair of resilient extensions extending from said one body end straddling said second terminals, said extensions cooperating with said socket projections to prevent said plug from bridging holes between socket sections and with said shoulders to force said plug towards said socket when bridging holes within a section.

4,108,523

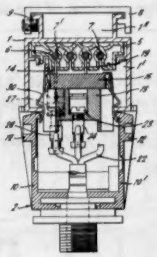
ELECTRIFIED CHANNEL, EQUIPPED WITH A SNAP-ACTING CONNECTOR

Edoardo Bolis, Milan, Italy, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed May 25, 1977, Ser. No. 800,506

Int. Cl.² H01R *13/54*

U.S. Cl. 339—22 B **2 Claims**



1. An electrified channel equipped with a snap-acting connector comprising:

four wire rods located side by side in said channel, one of said rods acting as a neutral wire and the remaining of said rods acting as phases of three distinct electric circuits;

contactors of said connector being elastically engaged with two of said rods when said connector is inserted into said channel;

one of said contactors being disposed in a fixed position to establish contact with said neutral wire when said connector is inserted into said channel;

a movable contactor to establish contact with one of said remaining of said rods according to a selected one of said three circuits;

a body having a cover to provide a guide for said one of said contactors by which a connection is established with said neutral wire;

two semi-caps encircling a portion of said body remote from said cover, said caps being secured to one another by self-tapping screws; and

a seat in which said movable contactor is slidingly fitted to establish a contact with one of said remaining of said rods;

said movable contactor being supported by a pawl which is slidingly fitted in a seat formed in said cover; said seat being formed with suitable notches for retaining said pawl on a selected one of said remaining of said rods.

4,108,524

ELECTRICAL CONNECTION ASSEMBLY AND CONNECTORS THEREFOR

Peter Charles Seligmann, Lombardy East, South Africa, assignor to Aeci Limited, Johannesburg, South Africa

Filed Jun. 15, 1977, Ser. No. 806,828

Claims priority, application South Africa, Sep. 27, 1976, 76/5757

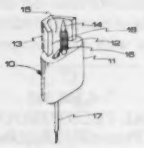
Int. Cl.² H01R *11/08*

U.S. Cl. 339—47 R **11 Claims**

1. Plug and socket connector comprising

a. an insulator body of an elastomeric material having a base partially encircled around its periphery by a wall extending vertically therefrom and a peg extending vertically from the base, the peg being disposed in spaced relationship relative to the wall and defining an open socket therebetween, and

b. an electrical contact pin composed of the spirally wound core on the peg of the bare terminal portion of an insulated



lead wire positioned through the insulator body and its base.

4,108,525

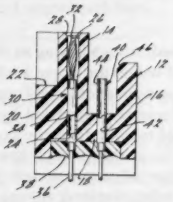
HERMAPHRODITIC EDGEBOARD CONNECTORS

Thomas Christopher Lincoln, Arcadia, Calif., assignor to Microdot Inc., Greenwich, Conn.

Continuation of Ser. No. 733,861, Oct. 19, 1976, abandoned. This application Aug. 19, 1977, Ser. No. 825,971

Int. Cl.[2] H01R *25/02*

U.S. Cl. 339—49 R **1 Claim**



1. A miniature high density hermaphroditic electrical connector comprising a pair of like, elongated insulating housings each of which is of generally U-shaped transverse cross section having a first leg and a second leg and a bight portion,

a plurality of longitudinally aligned closely spaced bores in said first leg of each housing, each of said bores having a chamfered end,

a plurality of aligned cantilevered twisted wire male electrical contacts supported in said bores, respectively, said male contacts extending into close radially spaced relation to the walls of said bores and terminating short of the ends of said bores, respectively, as to be individually protected and maintained substantially in alignment with the central axis of said bores,

a plurality of aligned closely spaced tubular female contacts in the bight portion of each housing extending parallel to the legs thereof, the bight portion of each housing having a transverse dimension complimentary to the width of said first leg for the acceptance thereof,

each end of the bight portion of each housing having an end closure member extending therefrom and each end of said first leg having complimentary slots therein for the acceptance of end closure members of the other housing,

said first leg of each housing having a recess therein for the acceptance of a second leg of the other housing, and

said housings being adapted to mate with one another with said end closure members of each housing being received by said complimentary slots of the other housing, said second legs of each housing being received by said recess in said first leg of the other housing, and said first leg of each housing extending between the legs of the other housing whereby said male contacts are accepted in said female contacts when said housings are assembled and said male and female contacts are directly supported by the bores in said first leg of each housing.

4,108,526

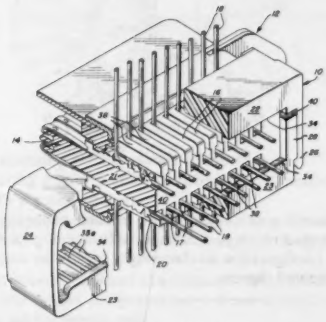
COVER FOR MULTI-WIRE CONNECTOR

William H. McKee, West Covina, Calif., assignor to TRW Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 649,812, Jan. 16, 1976, abandoned. This application May 13, 1977, Ser. No. 796,556

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—103 M **14 Claims**



1. A cover construction for use with a multi-wire connector having a plurality of parallel open-sided and open-ended wire-receiving channels defined by connector barriers and having wire engaging means disposed in such channels; said cover construction being formed of a discrete one-piece strip of flexible material adapted to snugly encompass the connector over such channels and having projecting ribs for reception in such connector channels and for interfitting with at least some of the connector barriers in a frictional interlock; each of said ribs being of a length so as to extend over a substantial portion of the length of the channel in which disposed and of a height so as to overlie in adjacent relationship a wire disposed in such channel whereby said ribs retain wires disposed in such wire-receiving channels in engagement with such wire engaging means; opposed end portions of said strip having disengageable interlocking means thereon for maintaining said strip in snug encompassing relation with the connector when in the engaged condition, and for allowing release of the strip from encompassing relation with the connector when in disengaged condition.

4,108,527

STRAIN RELIEF ASSEMBLY

George Harold Douty, Mifflintown; John Edward Lucius, Harrisburg, and Larry Leon Leitzel, Klingerstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 23, 1977, Ser. No. 809,507

Int. Cl.[2] H01R *13/58*

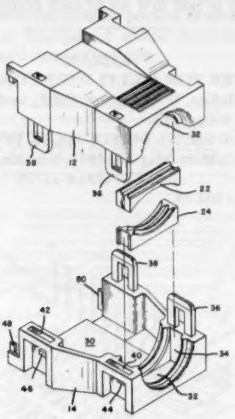
U.S. Cl. 339—107 **8 Claims**

1. An improved strain relief assembly comprising:

a pair of hermaphroditic housing members having means to latchingly secure said housing members together, said housing members together defining a cable passage therebetween, at least one recess in each said housing member aligned with a like recess in the other housing member and extending transversely of said passage, and means to engage an associated electrical connector housing; and

at least two cable engaging members each having at least one profiled cable engaging face with at least one ridge extending longitudinally thereacross, said cable engaging

members being profiled to be received in said recesses of said housing members;



whereby insertion of a selected pair of cable engaging members into said recesses defines a cable opening of desired size and configuration to clampingly engage an associated cable received therein.

4,108,528

PROBE ACTUATOR ASSEMBLY

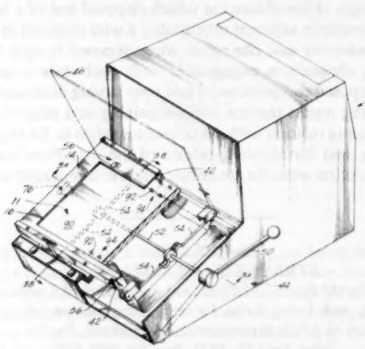
Everett James Long, Claremont, and Elmer W. Muench, Covina, both of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Continuation of Ser. No. 747,611, Dec. 6, 1976, abandoned. This application Jul. 22, 1977, Ser. No. 818,206

The portion of the term of this patent subsequent to Jul. 25, 1994, has been disclaimed.

Int. Cl.[2] H01R *3/04*

U.S. Cl. 339—117 P **18 Claims**



1. Apparatus for making electrical contact with test points on a test member, comprising:

means for mounting such a test member at a location for test;

a plurality of conductive probe heads each having, oppositely facing, a contact side and a bearing side, the contact sides of said probe heads being positioned adjacent said test member location;

backup means having a bearing side;

at least one resilient member having one side adjacent the bearing sides of said probe heads and an opposite side adjacent the bearing side of said backup means; and

means for applying pressure through said backup means and said at least one resilient member to the bearing sides of said probe heads forcing the contact sides thereof in the direction of said test member location, said backup means being harder than and substantially more rigid than said resilient member but sufficiently flexible so that with the probe heads in engagement with such test member in said location therefor the backup means conforms to the shape of the facing surface of such test member and said resilient member deforms so that all of said probe heads are forced into engagement with such test points.

4,108,529

ELECTRICAL FEEDTHROUGH DEVICES

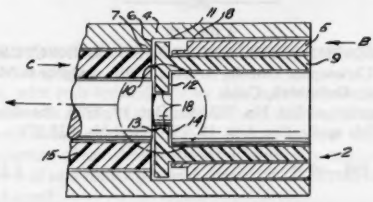
David Roger Evans, Petersfield, England, assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Nov. 9, 1976, Ser. No. 740,092

Claims priority, application United Kingdom, Nov. 14, 1975, 47070/75

Int. Cl.[2] H01R *17/04*; H01B *17/26*

U.S. Cl. 339—177 R **5 Claims**



1. An electrical feedthrough having an elongated conductive sleeve and, disposed within the sleeve a tubular body of dielectric material carrying a conductor, said conductor being physically spaced and electrically insulated by the dielectric body from the sleeve, said tubular dielectric body having a unitary radially projecting flange that projects inwardly of said tubular body and has an inner edge region defining an aperture, said inner edge region being disposed against said conductor and being radially compressibly stressed and deformed so as to exert radial and longitudinal pressure on the surface of the conductor to form a hermetic seal, said dielectric body further having a unitary radially projecting flange that projects outwardly of the tubular body said outwardly projecting flange having an outer region which is physically deformed by having been partially sheared against an edge provided by a first circumferential step formed on the inner surface of an outer part of the sleeve, said partially sheared outer region lying between said first circumferential step portion and a second circumferential step of complimentary shape to said first step portion, said second step being provided on an inner part of the sleeve disposed within said outer part of the sleeve, whereby a hermetic seal with the sleeve is formed, said second step including an outwardly facing circumferential surface located radially inwardly of said edge on said first step portion.

4,108,530

FEMALE TERMINAL AND METHOD OF MAKING SUCH

Richard A. Wandler, Clinton, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

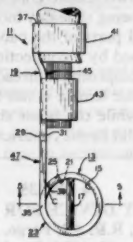
Filed Dec. 29, 1975, Ser. No. 645,044

Int. Cl.[2] H01R *13/12*

U.S. Cl. 339—256 SP **21 Claims**

1. A female terminal for receiving in electrical contacting engagement a pair of generally opposite contacts on a spade portion of a male terminal, the female terminal comprising a strip of electrical conductive material having a pair of opposite faces intersecting with a pair of opposite sides, at least one end edge of said strip respectively intersecting with said opposite faces and said opposite sides, a distal portion of said strip in-

cluding said at least one end edge being displaced with respect to the rest of said strip so as to comprise a generally cylindric section with said at least one end edge being adjacent one of said opposite faces and extending generally in opposed relation therealong between said opposite sides, said one opposite face within said cylindric section defining in part a bore therethrough between said opposite sides, at least one slot in said at least one end edge and intersecting with said bore, and at least



one tab integral with said strip and extending therefrom through said one opposite face into said at least one slot and generally circumferentially of said cylindric section to define a part of said bore, said tab and said cylindric section comprising means for effecting constant electrical contact between said bore and the opposite contacts of the spade portion irrespective of any generally diametral position in which the spade portion may be inserted across said bore.

4,108,531

FUSE HOLDER ASSEMBLY FIELD CONVERTIBLE FROM FUSE NON-REJECTING TO REJECTING MODES

Howard Reynolds, New Britain, Conn., assignor to General Electric Company, Plainville, Conn.

Filed Sep. 16, 1977, Ser. No. 833,790
Int. Cl.[2] H01H *85/24*
U.S. Cl. 339—258 F **12 Claims**

1. A fuse holder assembly field convertible from a non-rejecting mode capable of accepting a fuse terminal to a rejecting mode capable of accepting only a fuse terminal keyed with a special recess, said fuse holder assembly comprising, in combination:

A. a fixedly mounted fuse clip having a pair of spaced, generally parallel, flexible clamping arms defining therebetween a pocket for receiving a fuse terminal;

B. a rejection member having an interference element;

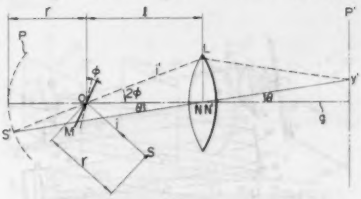
C. means movably mounting said rejection member for movement from a non-rejecting position with said interference element displaced from said pocket and both said clamping arms to a rejecting position with said interference portion disposed within said pocket to obstruct the full insertion therein of a fuse terminal lacking the special recess.

4,108,532

LIGHT BEAM SCANNING DEVICE

Kazuo Minoura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,744
Claims priority, application Japan, Jun. 23, 1976, 51-74028; Sep. 10, 1976, 51-108567; May 20, 1977, 52-59158
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.6 **9 Claims**



9. A scanning optical system comprising:

deflecting mirror means for providing a scanning operation with a scanning beam;

driving means for driving said deflecting mirror means to vibrate it so that its rotational angle ϕ is equal to $\phi_0 \sin K_1 t$;

a light source, disposed at a distance r from the center of said mirror means, for generating a beam toward said deflecting mirror means; and

focusing lens means, disposed between said deflecting mirror means and a surface to be scanned and having an optical axis passing through the center of said deflecting mirror means, for imaging the beam on the surface to be scanned in a form of spot,

said focusing lens means having a distortion characteristic represented by

$$y' = \frac{fr\phi_o}{r+l} \int F(\theta)d\theta$$

where y' is the distance measured on the surface to be scanned between the optical axis of said focusing lens means and the spot formed on the surface, l is the distance between the center of said deflecting mirror means and the nodal point of said focusing lens means on the entrance side thereof, and $F(\theta)$ is

$$\frac{f^2 + r^2 + 2l \cdot f(\theta)}{\{r + l \cdot f(\theta)\} \sqrt{\phi_o^2 - \left[\arccos\left(\frac{1}{r} f(\theta)\right)\right]^2}}$$

where $f(\theta)$ is $r^2\cos^2\theta - f^2\sin^2\theta - l\sin^2\theta$, and θ is the angle formed between the scanning beam directed toward the entrance side nodal point of said focusing lens means and the optical axis of said focusing lens means.

4,108,533

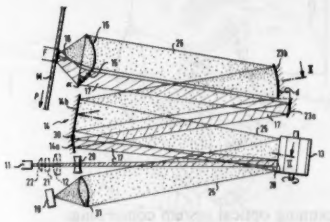
APPARATUS FOR COMBINING LIGHT EMANATING FROM A LINEAR SCANNING FIELD

Erwin Sick, Icking, and Angelika Staimer, both of Munich, Fed. Rep. of Germany, assignors to Erwin Sick Gesellschaft mit beschränkter Haftung Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Nov. 3, 1976, Ser. No. 738,484
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552331; Nov. 21, 1975, 2552332; Nov. 21, 1975, 2552333
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—6.7 **17 Claims**

1. In an apparatus for combining light emanating from a linear scanning field on a relatively small receiver via an opti-

cal arrangement producing a scanning light spot with a light ray scanning device onto which a light beam impinges, said arrangement further having optical element means of the transmitting beam of rays located in front of the light ray scanning device, a concave mirror means extending in the scanning direction, and a cylindrical lens parallel to the scanning field and extending in the vicinity of the latter, and in which arrangement the transmitting and receiving beams of rays are separated by pupil separation, characterized by plane mirrors associated with the transmitting and receiving beams of light



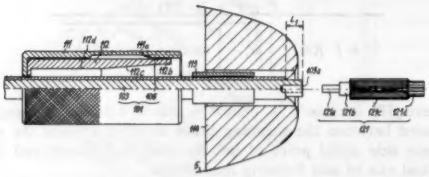
between the scanning field and the light ray scanning device for bending the receiving beam of rays perpendicular to the scanning direction and in the direction of the intersection point of the optical axis of the transmitting beam of rays located on the light ray scanning device by such an amount that it still strikes the light ray scanning device, but passes beside said optical element means, said concave mirror means comprising a transmitting concave mirror and a receiving concave mirror, and said plane mirrors being arranged between said concave mirrors and said light ray scanning device and tilted towards one another about an axis directed in the scanning direction.

4,108,534

APPARATUS FOR ON-SITE CONNECTION OF CABLES WITH OPTICAL FIBRES

Georges E. Le Noane, Batiment C 43 Ar Sante; André M. Mathern, Route du Busquet Brelevenez, and Gabrielle Morizur, Les Fontaines Bât. L n° 141, all of Lannion, France (22300)

Filed Jan. 25, 1977, Ser. No. 762,312
Claims priority, application France, Mar. 31, 1976, 76 09342
Int. Cl.[2] G02B *5/14, 5/16*
U.S. Cl. 350—96.21 **11 Claims**



1. Apparatus for on-site connection of two transmission cables comprising optical fibres, each cable having protective armouring enclosing a central core having a periphery formed with regularly spaced grooves and each holding a fibre provided with a thin sheath of uniform thickness, said apparatus comprising:

two extensions having a cylindrical shape and formed with grooves having the same angular pitch as the fibres in the cables to serve as the central core for connection of each cable respectively;

position-locating means for reconstituting the single component without sawing losses;

said position locating means comprising two flat calibrated keys cooperating respectively with two complementary diametrically opposite slots at the free ends of each extension;

means for rigidly holding each core and extension assembly comprising two hemicylindrical shells which are in turn enclosed in a cylindrical sheath;

means for aligning and joining the extensions comprising two solid shells having female hemicylindrical inner surfaces cooperating with the male cylindrical surfaces of the extensions and having male biconical outer surfaces which cooperate with two female cones;

said female cones being slideably mounted on the armouring of the non-bared parts of the cables and said two female cones being joined by a connecting nut;

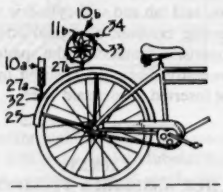
clamping means comprising a threaded plug in the rear part of the cone of the female cones for pressing against the nearest sheath while the other sheath abuts a re-entrant flange in said solid hemicylindrical shells.

4,108,535

SAFETY DEVICE FOR BICYCLE

Harold W. Slaughter, R.R. #2, Fargo, N. Dak. 58102

Filed Dec. 3, 1976, Ser. No. 747,423
Int. Cl.[2] G02B *5/12*
U.S. Cl. 350—99 **8 Claims**



6. A safety device suitable for mounting on bicycles, comprising, in combination:

a rotatable member having a generally horizontal axis of rotation and configured to rotate about said axis in response to air flow aligned with and air flow transverse to said axis;

a protective shroud comprising a housing encompassing said member and having a generally horizontal longitudinal axis extending between a pair of opposite open ends;

means for mounting said member in said shroud with said axis of rotation aligned with said longitudinal axis;

means for mounting said shroud fixedly with said axes in desired alignment with the direction of a flow of air;

and visual signal reflector means carried by said rotatable member for providing within said shroud a pattern visible in the direction of said axis of rotation which changes in appearance as said rotatable member rotates.

4,108,536

RETROREFLECTIVE ROADWAY SURFACE MARKING TAPE MATERIAL

Ludwig Eigenmann, Vacallo, Canton Ticino, Switzerland

Filed Jan. 14, 1977, Ser. No. 759,559
Claims priority, application Italy, Jan. 14, 1976, 19246 A/76
The portion of the term of this patent subsequent to Jun. 22, 1993, has been disclaimed.
Int. Cl.[2] G02B *5/128*
U.S. Cl. 350—105 **10 Claims**

1. A retroreflective roadway surface marking tape material of the type wherein the tape has a given width and has an upper traffic wear resisting upper layer wherein retroreflective systems each comprising a transparent body of essentially rounded cross-sectional configuration are partially embedded into said upper layer and adjacent to reflective means at least to its embedded surface portion,

wherein at least a part of said reflective systems comprises a transparent body consisting of an elongated element of transparent material, having a uniform cross-sectional essentially rounded configuration in any plane perpendic-

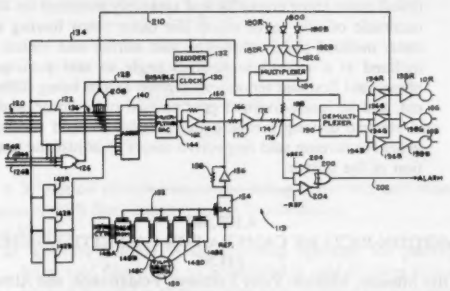
ular to its major dimension, the said systems being secured to said tape upper layer at intervals along the length of the tape in directions essentially perpendicular to the direction in which light rays to be retroreflected are supposed to impinge on the tape in service on a roadway surface.

4,108,537

LIGHT VALVE SYSTEM FOR MOTION PICTURE FILM PRINTER

Charles J. Watson, Elgin, and Walter Hrastnik, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 30, 1976, Ser. No. 756,047
Int. Cl.[2] G02F *1/03*; G03B *27/28*
U.S. Cl. 350—150 **22 Claims**



1. A light system for producing a modulated color content output beam, comprising:

a light source for producing a beam of substantially white light;

a plurality of band pass filters positioned in said beam path for dividing said beam into a plurality of monochromatic light beams;

an electro-optic value means positionable in each of said monochromatic light beams for attenuating the amount of said light passing therethrough;

programmable control means for said valve means to modulate the transmission characteristics thereof in response to a predetermined value provided by a plurality of data input means;

multiplexing means connected to said data input means providing a single output to control said valve means; and

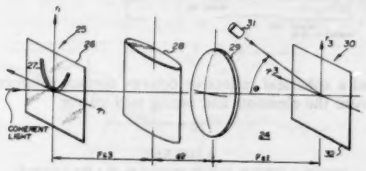
a plurality of mirrors positioned in at least some of said monochromatic light beams to recombine said beams into a single beam of modulated color content.

4,108,538

FREQUENCY PLANE FILTERS FOR AN OPTICAL PROCESSOR FOR SYNTHETIC APERTURE RADAR

E. Barry Felstead, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of National Defence, Ottawa, Canada

Filed Mar. 7, 1977, Ser. No. 774,902
Claims priority, application Canada, Apr. 30, 1976, 251565
Int. Cl.[2] G02B *5/18*
U.S. Cl. 350—162 SF **8 Claims**



1. A method for interferometrically generating a two-dimensional spatial filter, comprising the steps of:

diffracting a source beam of coherent light by passing at least a portion of the source beam through a slit in an opaque screen, the slit having a predetermined width and a curvature defined by a specified function to form a diffracted beam having a predetermined amplitude distribution;

imaging the diffracted beam onto a plane surface of a light responsive photographic plate by conducting the beam transversely through a cylindrical lens having a longitudinal axis disposed in parallel relation with the screen at a distance therefrom equal to the focal length of the cylindrical lens, and transversely through a spherical lens disposed intermediate the cylindrical lens and said plate at a distance from the plate equal to the focal length of the spherical lens, said imaging including predetermined magnification in an azimuth direction of the screen, lenses and plate and Fourier transformation in a direction orthogonal thereto to obtain a predetermined amplitude distribution on the plane surface;

illuminating the plane surface from a reference source of coherent light at a predetermined angle relative to the azimuth direction to obtain a predetermined amplitude transmittance in said plate proportional to the intensity of the exposing light;

developing the plate to obtain said filter in the form of a photographic transparency; and

bleaching the transparency to increase its efficiency.

4,108,539

REFLECTING LENS SYSTEM

Alfred Frans Gort, Loveland, Colo., and Charles E. Moore, Rochester, N.Y., assignors to Hewlett-Packard Company, Palo Alto, Calif.

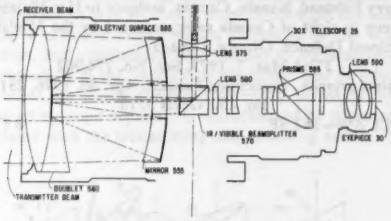
Filed Nov. 18, 1976, Ser. No. 742,938
Int. Cl.[2] G02B *17/08*
U.S. Cl. 350—201 **4 Claims**

1. A telescope comprising:

a concave second surface mirror having a negative refractive lens element, said mirror aligned upon an optical axis; and

a convergent meniscus lens having a concave surface thereof facing the concave surface of said mirror, said lens aligned

upon the optical axis and comprising a doublet having a biconvex element, a biconcave element facing said mirror,



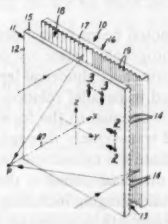
and a spherical reflective convex surface interposed between the elements and facing said mirror.

4,108,540

REFRACTOR-REFLECTOR RADIATION CONCENTRATOR

Raymond H. Anderson, St. Mary's Point, and Dennis F. Vanderwerf, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 17, 1976, Ser. No. 697,017
Int. Cl.[2] G02B *3/08*; F24J *3/02*
U.S. Cl. 350—211 **25 Claims**



1. An optical concentrator having front and rear portions for collecting and focusing incident radiation into a small area focus in front of the concentrator, said front portion of the concentrator having a linear echelon refractor formed therein; said rear portion of the concentrator having a linear echelon reflector formed therein; and the concentrator further comprising means for joining said refractor and said reflector to form a refractor-reflector structure having the increments of said linear echelon reflector crossed at approximately 90° relative to the increments of said linear echelon refractor for directing radiation incident on the front portion of the concentrator to said focus in front of the concentrator.

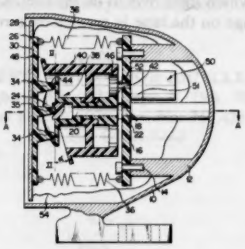
4,108,541

ELECTRICALLY CONTROLLED REAR-VIEW MIRROR WITH TWO COAXIAL ROCKING SYSTEMS

Kunihiro Eiraku, Tokyo, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1977, Ser. No. 771,790
Claims priority, application Japan, Feb. 27, 1976, 51-20729
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—289 **8 Claims**

1. An electrically controlled rear-view mirror comprising:
a mirror unit including a mirror having a specular surface attached to a surface thereof,
a first rocking system coupled to said mirror unit for continuously reciprocatively rocking said mirror unit or the specular surface of said mirror at a first cycle with a first axis as the center,
a second rocking system coupled to said mirror unit for continuously reciprocatively rocking said mirror unit or the specular surface of said mirror at a second cycle which is different from said first cycle and with a second axis as the center, said second axis being at an angle to said first axis,
a single electric driving means coupled to said first and second rocking systems for driving and stopping both of said first and second rocking systems simultaneously to stop said mirror at a position substantially in the desired direction,
a substrate carrying both said first and second rocking systems and said driving means, and
a center shaft mounted to said substrate, the longitudinal axis of said center shaft defining a central axis of said rear-view mirror,
said first rocking system including a substantially cylindrical inner rotor rotatably supported by said center shaft, the



inner rotor having an inner inclined-plate coupled to said mirror and which is inclined at a first prescribed angle to a principal plane of said rear-view mirror, said principal plane being perpendicular to said central axis and being located in the vicinity of said inner inclined plate, and an outside-toothed gear on said inner rotor,
said second rocking system including a substantially cylindrical outer rotor coaxially and rotatably mounted on the outerside of said inner rotor, the outer rotor having an outer inclined-plate coupled to said mirror and which is inclined at a second prescribed angle to said principal plane, said first and second prescribed angles being different, and an inside-toothed gear on said outer rotor, and
said electric driving means being coupled to said toothed gears for turning said respective rotors to adjust the position of the mirror.

4,108,542

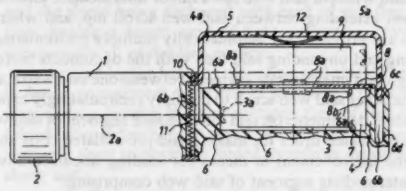
MOTION-PICTURE CAMERA FOR CASSETTE-LOADED FILM

Otto Stemme, Munich; Peter Lermann, Feldkirchen, and Alfred Winkler, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Dec. 20, 1976, Ser. No. 752,312
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557274
Int. Cl.[2] G03B *23/02*
U.S. Cl. 352—72 **15 Claims**

1. In a motion picture camera for use with cassette-loaded film, a combination comprising
a camera housing provided with an internal chamber and having a surface formed with an access opening for said chamber;
a carrier removably mountable in said chamber;
first means for selectively mounting on said carrier one film cassette to be located in said chamber and another film cassette which at least in part projects through said opening and beyond said surface when the one cassette is located in said opening;
a cover for said opening; and
second means mounting said cover on said housing for displacement between a retracted position in which it is

substantially flush with said surface and which it can assume in the absence of the other cassette, and an ex-



tended position in which is projects beyond said surface and which it assumes in the presence of the other cassette on said carrier.

4,108,543

CAMERA FOR MOTION AND STILL PICTURES

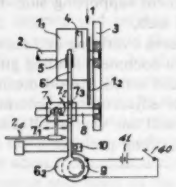
Rudolf Leistner, Munich, Fed. Rep. of Germany, assignor to Braun AG., Kronberg Taunus, Fed. Rep. of Germany

Continuation of Ser. No. 436,160, Jan. 24, 1974, abandoned, which is a continuation of Ser. No. 11,049, Feb. 13, 1970, abandoned. This application May 30, 1975, Ser. No. 582,208

Claims priority, application Luxembourg, Feb. 27, 1969, 58112

Int. Cl.[2] G03B *17/46*

U.S. Cl. 352—121 **14 Claims**



1. A motion picture camera for taking series and individual pictures with film, comprising, in combination:

a housing,

an aperture defined in said housing operable for passing light; said film being so positioned in said housing that a portion thereof is aligned with said aperture for exposing said portion to light;

film advancement means operable for advancing said film to a position wherein another portion will be aligned with said aperture;

moveable shutter means having closed and open positions for blocking and, respectively, unblocking the passage of light through said aperture;

moving means for moving said shutter means between the open and closed positions;

shutter control means operable for arresting said shutter means in its open position; and

primary control means connected to said shutter means, to said film advancement means, and to said shutter control means for operating on a single activation first to activate said moving means to move said shutter means to its closed position, then to activate said film advancement means to advance said film, subsequently to activate said moving means to move said shutter means to its open position, and thereafter to activate said shutter control means to arrest said shutter means in its open position.

4,108,544

DRIVING MECHANISM FOR TRAVELLING ORIGINAL CARRIER IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE

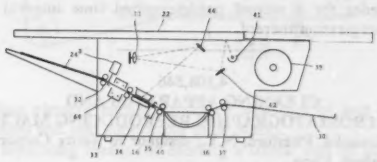
Akira Mitsuyama, Yamatokoriyama; Hiroaki Uchiyama, Nara, and Masanobu Deguchi, Yamatotakada, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 22, 1976, Ser. No. 743,941

Claims priority, application Japan, Nov. 21, 1975, 50-143531

Int. Cl.[2] G03G *15/28*

U.S. Cl. 355—8 **5 Claims**



1. In an electrophotographic copying machine having a reciprocating original carrier or having a reciprocating exposure system, a driving system for reciprocating said original carrier or said exposure system comprising:

a motor rotating in a certain direction;

feedforward spring clutch means for transmitting the rotation of the motor to a feed gear in its operative condition;

reverse spring clutch means for transmitting the rotation of the motor to a reverse gear in its operative condition;

transmitting means for transmitting the revolution of the feed gear and the reverse gear to said original carrier or said exposure system; and

control clutch means for selectively operating said feedforward spring clutch means and said reverse spring clutch means, said control clutch means including:

first means for receiving the rotation of said motor;

a cam plate rotatable in unison with said first means;

second means for stopping the cam plate at a first position;

third means for operating the feedforward spring clutch means when the cam plate is stopped at the first position;

fourth means for stopping the cam plate at a second position; and

fifth means for operating the reverse spring clutch means when the cam plate is stopped at the second position.

4,108,545

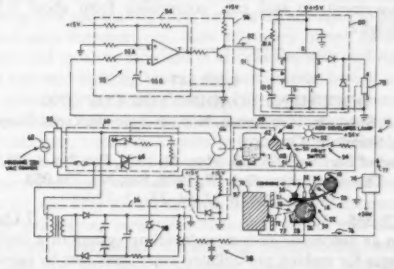
DEVELOPER SUPPLY CONTROL SYSTEM IN A COPIER

Alton B. Eckert, Jr., Norwalk, and Julius Gluck, Noroton Heights, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 20, 1976, Ser. No. 752,346

Int. Cl.[2] G03G *15/00;* B05B *5/02*

U.S. Cl. 355—14 **5 Claims**



1. In a copier including a photoreceptor, means for forming an electrostatic latent image on the photoreceptor, a rotatable

applicator for contacting the latent image with developer from a working supply thereof, and means for dispensing a replenishing supply of developer, developer supply control means comprising:

a. means for generating a signal indicative that the working supply of developer is in need of replenishment;

b. means operable in response to said indicating signal for energizing the dispensing means;

c. means for preventing energization of the dispensing means for a first predetermined time interval after the applicator commences rotation and

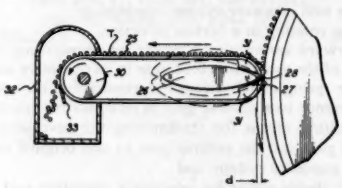
d. means for maintaining energization of the dispensing means for a second predetermined time interval after energization thereof.

4,108,546

CLEANING APPARATUS AND ELECTROSTATOGRAPHIC REPRODUCING MACHINE

Ivan Rezanka, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,303
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 **26 Claims**



1. A cleaning apparatus for an electrostatographic reproducing machine for removing magnetic toner from an imaging surface of said machine, said cleaning apparatus comprising:

means for generating an inhomogeneous magnetic field at said imaging surface comprising;

a magnetic member having at least one magnetic pole arranged in close proximity to said imaging surface with an edge of said member at said pole opposing said imaging surface and being spaced from said imaging surface so as to define a gap extending from said imaging surface to said edge of from about 0.005 inches to about 0.050 inches;

means for receiving said magnetic toner particles removed from said imaging surface and for transporting them away from said imaging surface comprising a transport surface, said transport surface being interposed between said magnetic member and said imaging surface;

said transport surface and said imaging surface being arranged for relative movement with respect to one another; and

the ratio of the longitudinal width of said edge of said magnetic member, as measured in the direction of relative movement, to said gap, comprising from about 0.5 to about 2.

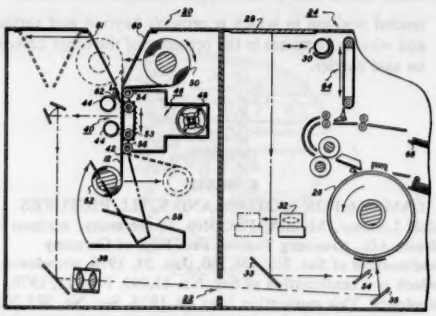
4,108,547

DOCUMENT LOADING FOR COPYING

Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 560,755, Mar. 24, 1975, Pat. No. 4,008,956. This application Oct. 27, 1976, Ser. No. 736,051
Int. Cl.[2] G03B *27/64, 27/62, 27/46*
U.S. Cl. 355—50 **7 Claims**

1. In an automatic document handling system of a copying apparatus for making pre-collated copy sheet sets by repeated collated imaging of a set of original documents on an elongated windable document holding web having a document supporting side, wherein a spaced pair of oppositely wound scrolls of said web are provided for retaining said documents within said scrolls, wherein said scrolls are normally facing one another and forming a nip with said document supporting side of said web, and wherein said web has a minor intermediate unwound segment extending between said web scroll nip, and wherein means are provided for automatically multiply recirculatingly winding and unwinding said web with the documents thereon through said intermediate segment between one said web scroll and the other said web scroll to multiply recirculatingly expose individual documents on said intermediate segment of said web in a pre-collated order for making said pre-collated copy sheet sets, the improvement in means for loading documents onto said intermediate segment of said web comprising:



means for selectively repositioning at least one of said web scrolls relative to said intermediate segment of said web into a position providing for the loading of documents onto said document supporting side of said intermediate segment of said web,

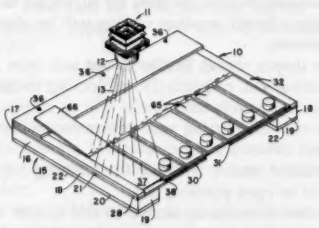
a scroll shroud means overlying and movable with said one web scroll, and a document loading guide means movable together with said scroll shroud means into a document loading position adjacent said intermediate segment of said web when said one web scroll is so repositioned into said document loading position.

4,108,548

DEVICE FOR EXPOSING PHOTOGRAPHICALLY SENSITIZED SHEETS

Barbara Jean Hawkins, 1622 E. Clinton Ave., Fresno, Calif. 93704

Filed Sep. 12, 1977, Ser. No. 832,593
Int. Cl.[2] G03B *27/58, 27/44*
U.S. Cl. 355—74 **4 Claims**



1. A device for exposing photographically sensitized sheets comprising:

A. a base having a substantially flat display surface with magnetically attractive portions and adapted to receive one of said sheets in facing engagement thereon;

B. a shield having opposite edges and a fold line extending

therealong substantially midway between said edges, said shield being severed from one edge along courses inwardly substantially to said fold line to form a plurality of flap portions independently foldable about the fold line and the shield being darkened with each of said flap portions having a target area of light coloration covering substantially all of the flap portion;

C. means borne by the base for mounting said shield thereon in facing engagement with one of said sheets on the display surface leaving the flap portions thereof free to be folded independently from positions in facing engagement with said sheet to positions folded therefrom exposing the sheet; and

D. magnetically attractive members individually borne by the flap portions remote from said fold line of the shield for magnetic attraction to said magnetically attractive portions of the display surface independently to secure said flap portions in facing engagement with the sensitized sheet sealed from exposure.

4,108,549

POLYCHROMIC REPRODUCTION PROCEDURE USING STRIPPABLE MASKS

Roger R. Hermelin, Olivet, France, assignor to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Sep. 22, 1977, Ser. No. 835,756

Claims priority, application France, Sep. 22, 1976, 76 28443

Int. Cl.[2] G03B *27/32, 27/28;* G03C *7/04;* G03F *1/00*

U.S. Cl. 355—77 **9 Claims**

1. A polychromatic reproduction procedure for obtaining a reproduction having a plurality of shading degrees for each primary color in the polychromatic system characterized by the fact that only one mask capable of being stripped is required to reproduce all the shading degrees for each primary color, said mask having recorded thereon areas to be shaded a plurality of shading degrees and serving sequentially as the mask for the areas to be most densely shaded and upon stripping as the mask for the areas to be shaded the remaining shading degrees, said procedure comprising:

stripping said mask of the areas to be most densely shaded, placing said mask on said light-sensitive film and underexposing said film to light to form underexposed areas corresponding to the areas to be most densely shaded;

subsequently stripping said mask of the next densest area, replacing said mask on said film and again underexposing said film to light such that the areas to be most densely shaded are again exposed and in addition underexposed areas are formed on said film corresponding to the next densest areas in said mask;

repeating said stripping and underexposing for each of the plurality of shading degrees, each time reexposing the denser areas and forming underexposed areas corresponding to the newly stripped dense area in said mask.

4,108,550

APPARATUS FOR LIFTING AN ELECTROSTATICALLY CHARGED FLEXIBLE RECORDING MATERIAL

Roland Moraw, Naurod, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 422,683, Dec. 7, 1973, abandoned. This application Jul. 12, 1976, Ser. No. 704,593

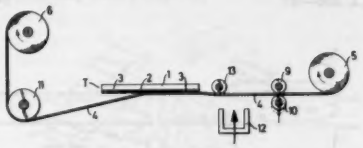
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1972, 2260570

Int. Cl.[2] G03B *15/00*

U.S. Cl. 355—133 **4 Claims**

1. An apparatus for peeling off an adherent, electrostatically charged, flexible recording material from an electroconductive supporting plate, said material being a film provided with a thermoplastic photoconductor layer, comprising electroconductive supporting plate means composed of a glass plate with a transparent electroconductive layer thereon which is provided with electrode means, said supporting plate means being adapted to contact one side of said material,

guide means for the recording material arranged adjacent to the supporting plate means and so mounted as to project beyond an image plane on said supporting plate means in the direction in which said recording material is to be peeled off,



holding element means positioned upstream of said guide means and said supporting plate means,

and separating means for exerting a lateral pull on said recording material when said material is held by said holding means, whereby said material is progressively separated from said image plane in a wedge-like manner by said separating means.

4,108,551

OBSERVATION AND AIMING APPARATUS, PARTICULARLY ON A VEHICLE

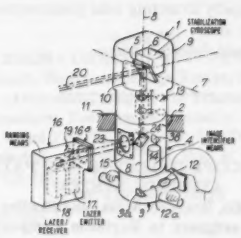
Claude Edmond Georges Weber, Bois-Colombes, France, assignor to Societe d'Etudes et de Realisations Electroniques, Asnieres, France

Filed Dec. 15, 1976, Ser. No. 750,653

Claims priority, application France, Dec. 29, 1975, 75 39960

Int. Cl.[2] G01C *3/08;* G02B *5/08*

U.S. Cl. 356—4 **12 Claims**

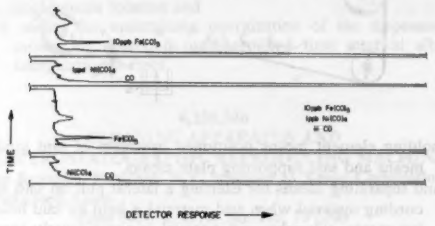


1. A periscope comprising a panoramic sighting head for visually sighting on an object, and a sighting tube in association therewith having at least one eyepiece for an observer, said sighting tube and said sighting head being arranged to have an optical path therebetween, laser telemetry means having an emitter and receiver mounted in association with said sighting head and said sighting tube, a dichroic mirror having a front face reflecting the beam from said laser emitter toward the object and for reflecting the beam from said object toward said laser receiver, a reticule located in front of said dichroic mirror, and a reflecting trihedron located behind said dichroic mirror for causing the reflection of the image of said reticule from the rear face of said dichroic mirror to said eyepiece and image intensifying means for nocturnal vision, said dichroic mirror and said image intensifying means being movably mounted for alternate positioning along the optical path whereby said optical path is common for daytime vision, nighttime vision and laser telemetry.

4,108,552
METHOD AND SYSTEM FOR DETECTING ULTRA-TRACE QUANTITIES OF METAL CARBONYLS

Terry Marshall Austin; Eugene Thomas Carroll, both of St. Albans, and Mildred Choi Bowen, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 29, 1976, Ser. No. 700,842
Int. Cl.[2] G01V 3/30
U.S. Cl. 356—87 14 Claims



1. A method for detecting ultra trace levels of at least one predetermined metal carbonyl within a fluid matrix comprising the steps of:

(a) sampling said fluid matrix to provide a fluid sample of predetermined volume;

(b) passing said fluid sample together with a carrier gas through a component separator for separating said predetermined metal carbonyl from the other components in said fluid sample;

(c) forming a binary admixture between the separated metal carbonyl component and said carrier gas;

(d) oxidizing said binary admixture in an oxygen rich flame such that a molecular wavelength emission spectrum is generated for said admixture;

(e) optically selecting a predetermined range of wavelengths in the ultraviolet to visible light region of said emission spectrum from between 350 to 625 nanometers inclusive;

(f) electro-optically detecting said predetermined range of wavelengths; and

(g) indicating said detected range.

4,108,553
LASER GYROSCOPE DETECTOR AND PATH LENGTH CONTROL SYSTEM

Albert N. Zampiello, Boxboro, Mass., and Bradley J. Patch, Jr., Owego, N.Y., assignors to Raytheon Company, Lexington, Mass.

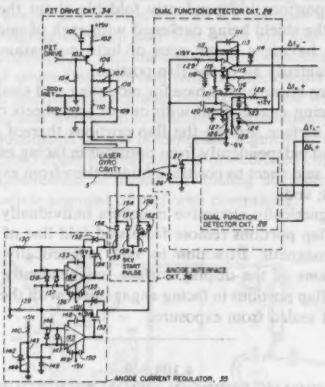
Filed Jan. 4, 1977, Ser. No. 756,672
Int. Cl.[2] G01B 9/02; G01P 9/00
U.S. Cl. 356—106 LR 14 Claims

1. In combination:

a laser gyroscope cavity having a closed path for propagation of a plurality of waves, each of said waves being of a different frequency;

at least two detecting means, at least two of said waves being coupled to each of said detecting means; and

first and second filtering means being coupled to each of said detecting means, said first filtering means having a passband below a predetermined frequency and said second filtering means having a passband above said predetermined frequency, said predetermined frequency being below the minimum output signal frequency from said second filtering means produced by rotation of said laser gyroscope cavity, and substantially all the signal power from each of said detecting means of a frequency below said predetermined frequency flowing to the corresponding first filtering means and substantially all the signal power from each of said detecting means of a frequency

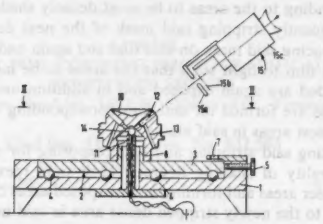


above said predetermined frequency flowing to the corresponding second filtering means.

4,108,554
Y-JET TIP TESTER

William Inglis Joyce, Skelmorlie, Scotland, assignor to Babcock & Wilcox, Limited, London, Great Britain

Filed Feb. 17, 1977, Ser. No. 769,761
Int. Cl.[2] G01B 11/00, 11/27
U.S. Cl. 356—156 6 Claims



1. An apparatus for testing a plurality of similar bores of a fluid fuel burner tip to determine the similarity in cross section and the disposition of each bore relative to the central axis of the burner tip, a recess formed in the burner tip, the bores diverging from the recess, a member threadably engaged with the burner tip, means fixed relative to the central axis, means associated with the first named means such that a beam of radiation may be passed through one of the bores along a constant path from one to the other of the associated means, means for indicating the amount of radiation that has passed through the bore, the member and one of the associated means being rotatable relative to each other about the central axis so that each bore may be brought into such orientation relative to the beam that an equal amount of radiation will pass through the bore if its cross section and disposition relative to the central axis is similar to that of the first bore.

4,108,555

TWO-BEAM COLORIMETER

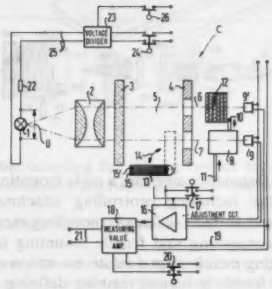
Johan Helder, Brugge; Hubert De Steur, Drongen, both of Belgium, and Wolfgang Pernegger, Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 5, 1976, Ser. No. 674,050

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1975, 2518857

Int. Cl.[2] G01J 3/48

U.S. Cl. 356—184 5 Claims



1. A two-beam colorimeter comprising; in combination,

a transparent cuvette for supporting an object liquid during an operational run and susceptible to residual impurities,

first and second photo-sensitive photoelectric devices, said first photo-sensitive device disposed adjacent said cuvette,

an incandescent light source, a condenser spaced from said light source and a diaphragm spaced from said condenser and including first and second apertures aligned with said first and second photo-sensitive devices to pass a measuring light beam and a reference light beam therethrough, respectively,

a reference filter between said second aperture of said diaphragm and said second photo-sensitive device to compensate for the light absorption of said cuvette per se and differences in the operating characteristics of said first and second photo sensitive devices,

selective adjusting filter means movable into said measuring light beam prior to an operational run on the object liquid to compensate for the natural light absorption of the object liquid in said cuvette and movable out of said measuring light beam during an operational run, said selective filter means being selectable in filtering characteristics to match the object liquid,

an adjusting circuit connected to said first photo-sensitive device and operable in a first mode prior to an operational run to set to an attenuation factor representing the object liquid in said cuvette and operable in a second mode during an operational run to correspondingly factor the output of said first photo-sensitive device, and

comparison means connected to said second photo-sensitive device and to said adjusting circuit to provide an signal during an operational run representing the colorimetric character of the object liquid.

4,108,556

PRINTING PISTON ASSEMBLY

Thomas Patrick Connoy, New Brighton, Minn., assignor to Kroy Industries, Inc., Stillwater, Minn.

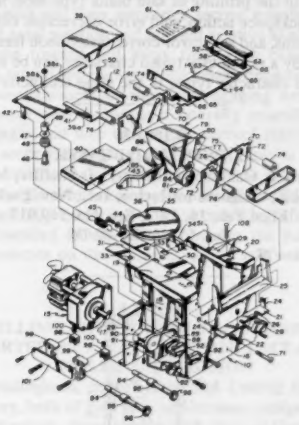
Filed Sep. 24, 1976, Ser. No. 726,106

Int. Cl.[2] B41J 1/02; B41F 3/54

U.S. Cl. 400—48 19 Claims

1. In a printing apparatus of the type having a printing station, a force resisting means for resisting a printing force, a force exerting means positioned in printing alignment with said printing station for exerting a printing force toward said force resisting means, and an image carrier and a font element with at least one raised character, each being disposed between said force resisting means and said force exerting means and each being positionable in printing alignment with said printing station wherein said force exerting means comprises:

a generally wedge shaped element having a curved force exerting surface extending through an arc of less than approximately ninety degrees;



support and guide means for supporting and guiding said force exerting surface in rolling movement with respect to said printing station between first and second positions such that a normal printing force is exerted against successive portions of said raised character during said rolling movement to transfer an image of said raised character to said image carrier; and

means for moving said force exerting surface in rolling movement between said first and second positions.

4,108,557

ERROR CORRECTING TYPEWRITER

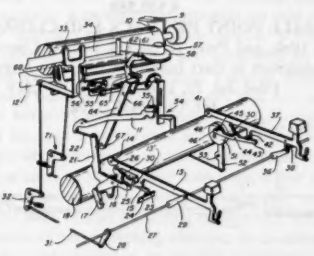
Jürgen Skrzipek, Berlin, and Helge Reuter, Nuremberg, both of Fed. Rep. of Germany, assignors to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,537

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 2606013; Jul. 22, 1976, 2633021

Int. Cl.[2] B41J 29/16

U.S. Cl. 400—697.1 5 Claims



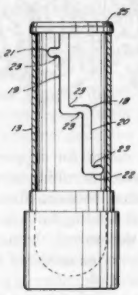
1. An error correcting typewriter having an error correction ribbon,

means for elevating said error correction ribbon opposite the printing point of a typewriter,

means for feeding said error correction ribbon to present a fresh area for elevation opposite said printing point,

a carriage,
means for initiating a backspace action for backspacing said carriage,
a silent type action having a blank type face,
an error correction keylever depressible to a first limit position for initiating operation of said silent type action, and
means responsive to depression of said error correction keylever to said first limit position for operating, in advance of the printing of said blank type face, in sequence, said backspace action, said error correction ribbon elevating means, and said error correction ribbon feeding means, whereby a previously typed character can be erased and a correct character typed in the same character space.

4,108,558
LIPSTICK DISPENSER
Michael Radice, Oakland, and Robert J. Sheffler, Morganville, both of N.J., assignors to Revlon, Inc., New York, N.Y.
Filed Feb. 16, 1977, Ser. No. 769,017
Int. Cl.[2] A45D *40/06*
U.S. Cl. 401—78 **1 Claim**

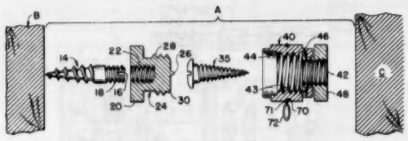


1. An inner cylindrical sleeve for use in a holder for dispensing liquids, said sleeve having a pair of diametrically opposed slots that are adapted to receive a pair of lugs projecting from a movable cup within the sleeve, each of said slots consisting of a lateral portion, two longitudinal portions extending respectively upward and downward from the opposing ends of the lateral portion, and lateral passages near the top end of the upper longitudinal portion and at the bottom end of the lower longitudinal portion, wherein the width of the lateral passages is narrowed at the points where the logitudinal and lateral passages meet.

4,108,559
BALL POINT PEN BACK END CLOSURE
Franklin Dick, and Peter H. Seckel, both of Upper Montclair, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Jul. 21, 1976, Ser. No. 707,159
Int. Cl.[2] B43K *7/02*
U.S. Cl. 401—217 **6 Claims**

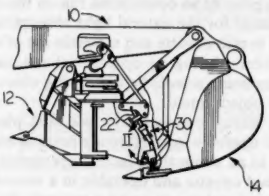
1. An air-permeable plug adapted to act as a positive obstruction to writing fluids typically used in writing implements and comprising a substantially continuous sheath having an inside diameter of between about 0.025 and 0.250 inches and a low twist substantially continuous braided filamentous material having a total denier of between about 3000 and 25,000 encased in said sheath and further characterized by its perviousness to air and its imperviousness to writing fluids when exposed to and contacted therewith.

4,108,560
SIGN MOUNTING FASTENER
Robert Willis Minogue, Hayward, Calif., assignor to Federal Signal Corporation, Chicago, Ill.
Filed Jan. 14, 1977, Ser. No. 759,597
Int. Cl.[2] F16C *11/00;* **F16D** *1/12, 3/00*
U.S. Cl. 403—33 **7 Claims**



1. A sign fastener comprising a male mounting member; said male member including protruding attachment means for mounting to a surface; a female mounting member; coupling means for connecting said female mounting member to said male mounting member upon relative rotation of said coupling means; said female mounting member defining an aperture for permitting a fastener to pass there through to hold said female mounting member to a surface; relative rotation means on one of said mounting members to permit rotation of said coupling means relative to said mounting members to effect fastening of said sign; and, a scribe mounted to one of said members to permit said members to impress a mark indicating its location on a surface.

4,108,561
APPARATUS FOR FORCIBLY ENGAGING MACHINE ASSEMBLIES
James E. Kelley, Metamora, and Orrin A. Stemler, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed May 5, 1977, Ser. No. 794,000
Int. Cl.[2] F16B *7/10*
U.S. Cl. 403—166 **8 Claims**



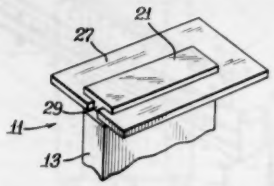
1. In an apparatus having first and second assemblies each having at least one inclined plane, said first assembly including a first member having first and second end portions with said inclined plane on the first end portion, said inclined planes contacting one another at a locking position and releasably fixing said first assembly to said second assembly, the improvement comprising:
means for urging one of the inclined planes into the other inclined plane at a force sufficient for maintaining the inclined planes in forcible contact with each other during vibrational movement of one of said first and second assemblies and during wear of the inclined planes for maintaining locking contact and automatically compensating for said wear, said urging means including a link assembly connected to and positioned between the end portions of the first member.

4,108,562

RELEASABLE COUPLING

James C. Collard, and Wesley G. Martin, both of Manitowoc, Wis., assignors to Kraft, Inc., Glenview, Ill.

Filed Nov. 9, 1977, Ser. No. 849,868
Int. Cl.[2] F16B 9/02
U.S. Cl. 403—254 5 Claims



1. A releasable coupling for joining two or more structural components in detented interconnection to one another comprising

(a) a structural member having a first side wall and a second side wall;

(b) at least one channel in each of said first and said second side walls to form a pair of opposed channels separated by a web adjacent an end of said structural member;

(c) the outermost wall of said channels being formed by an end wall member;

(d) at least one lug located at one end of at least one of said channels;

(e) a receiving member having an elongated slot; and

(f) a recess formed adjacent one end of said slot for receiving said lug in detented releasable connection by sliding said slot through said pair of channels;

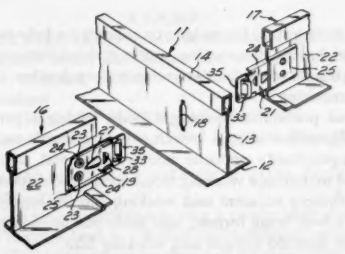
said end wall member being affixed to said structural member in a manner so that there is no substantial displacement of said end wall member being engaged with said slot of said receiving member.

4,108,563

LOCKING CONNECTION FOR SUSPENSION CEILING SYSTEMS

Donald A. Brown, Westlake; Paul D. LaLonde, Avon Lake, and Gerald L. Koski, Parma, all of Ohio, assignors to Donn Products, Inc., Westlake, Ohio

Continuation-in-part of Ser. No. 625,572, Oct. 24, 1975. This application Aug. 11, 1976, Ser. No. 713,287
Int. Cl.[2] F16B 7/22
U.S. Cl. 403—347 24 Claims



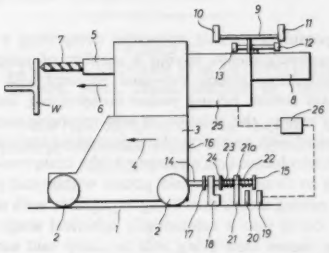
1. A locking connection for a planar grid system or the like which includes a plurality of parallel first support members and a plurality of second support members which extend perpendicular to and between said first members comprising a web provided by said first members formed with a slot opening therethrough, an end connector on each of said second members, each end connector being proportioned so that two of them are insertable through said slot openings from opposite directions in abutting side-by-side relationship to lock a pair of said second members together on opposite sides of an associated first member, said end connectors each providing an opposed pair of surfaces which extend substantially perpendicular to the associated second members and interlocking with opposed surfaces on the other connector when two end connectors are inserted in opposite directions through said slot, said interlocking surfaces operating to positively position said end connectors and their associated second members in a predetermined axial position and prevent relative axial movement therebetween toward and away from each other, said slot preventing lateral separation of said end connectors and preventing disengagement of said interengaging surfaces, each end connector also including a laterally extending portion which engages said web on the side thereof remote from the associated second member to prevent withdrawal of each end connector from said slot independent of the other connector whereby a single connector may be installed and locked in said slot, said laterally extending portion operating after one connector is installed in said slot to prevent the insertion of a second connector on the incorrect side of said one connector.

4,108,564

DRILLING DEVICE WITH TOOL CARRIER SUPPORTED BY A CARRIAGE DISPLACEABLE IN DRILLING DIRECTION

Werner Peddinghaus, Sprockhovel, and Ludwig Regenbrecht, Gevelsberg, both of Fed. Rep. of Germany, assignors to Werner Peddinghaus, Bruchhausen, Fed. Rep. of Germany

Continuation of Ser. No. 611,645, Sep. 9, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,696
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1974, 2410337
Int. Cl.[2] B23B 39/14
U.S. Cl. 408—10 20 Claims



1. A drilling device for workpieces of different sizes, which includes: a support, a carriage reciprocable on said support in the drilling direction of said drilling device, a tool carrier adapted to receive a drilling tool and supported by said carriage and movable on said carriage, variable speed power operable means between said carriage and said tool carrier for causing the latter to feed said drilling tool carrier thereby toward and through a workpiece, said carriage including an extension movable therewith, a switching element secured to said extension so as to be movable therewith, a first switch on said support connected to said power operable means and located in the path of said switching element for actuation of said first switch by said switching element, an abutting element connected to said extension in spaced relationship to said switching element, first stationary bearing means on said support located on that side of said abutting element which faces towards said switching element, said first stationary bearing means being spaced from said abutting element by a distance slightly greater than the distance by which in said switching element is spaced from said first switch when said drilling device is in a non-drilling position, and means associated with

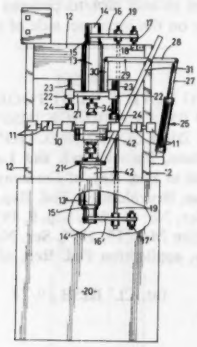
said tool carrier and said carriage and operable in response to said tool carrier having moved in a first direction into contact with a workpiece mounted to be drilled to move said carriage in a second direction opposite to said first direction by a distance to cause said switch element to close said first switch to thereby bring about a reduction in the speed of said power operable means and thereby said tool carrier in the direction toward the workpiece to be drilled.

4,108,565

POTATO PROCESSING

Jacobus Wilhelmus Janssen, 3 Lincoln St., Brooklyn, Wellington, New Zealand

Filed Jul. 21, 1977, Ser. No. 817,918
Int. Cl.[2] B23B *39/22*; B23G *1/20*
U.S. Cl. 408—37 **13 Claims**



1. A potato processing apparatus comprising a rotatable potato receiving means having a number of receptacles, a potato processing station provided adajcent said receiving means, said station having potato compressing, cutting and removing means, the rotation of said receiving means being synchronised with operation of the processing station such that with a potato located on a receptacle the compressing means operating to firmly lodge said potato within said receptacle and said cutting means then being engageable with said potato so as to cut it into a substantially spherical shape and said removing means then being able to cause said substantially spherical potato to be removed from said potato receiving means.

4,108,566

MECHANIZED CONTOUR-FOLLOWING DRILL MACHINE

Everett E. Jones, 3801 S. Oliver, Wichita, Kans. 67210

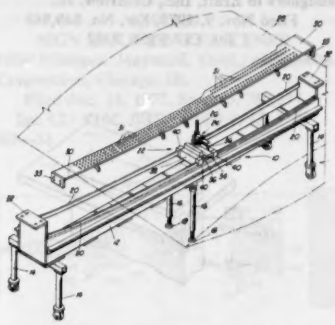
Filed Jul. 18, 1977, Ser. No. 816,530
Int. Cl.[2] B23B *47/28, 49/02*
U.S. Cl. 408—115 R **7 Claims**

1. A mechanized contour-following drilling machine, the machine orienting a drill spindle of a drill assembly perpendicular to a plane tangent to a contoured surface to be drilled, the machine comprising:

a drill stand;

a pair of parallel rails disposed in a spaced relationship from each other and mounted on top of said stand, said rails contoured to correspond with the contoured surface to be drilled which is disposed adjacent thereto; and

means for supporting the drill spindle of the drill assembly on top of said rails and perpendicular thereto, and guiding



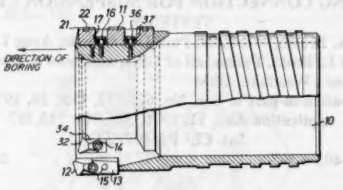
the drill assembly along the length of said rails, and laterally between said rails.

4,108,567

BORING TOOL

Kurt Heinrich Albert Erich Faber, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Continuation of Ser. No. 648,016, Jan. 12, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,656
Claims priority, application Sweden, Jan. 20, 1975, 7500542
Int. Cl.[2] B23B *51/00, 41/02*
U.S. Cl. 408—224 **2 Claims**



1. A boring tool, for making or enlarging a hole in metal, of the kind having the cutting action divided between several cutting inserts whose paths overlap with each other, the boring tool comprising:

a head portion comprising a body having a periphery, a longitudinal axis, a working end, a shank end situated longitudinally opposite said working end, said working end including a working face, a guide pad disposed on said periphery adjacent said working end for engaging a side of a bore being formed, said guide pad including a leading end directed toward said working face;

an outer insert including a cutting edge and located at said periphery with said cutting edge projecting from said working face;

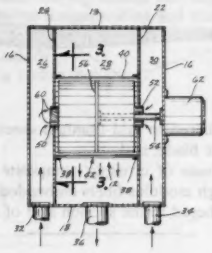
an inner insert including a cutting edge and located at the end face between said longitudinal axis and said outer insert,

said leading end of said guide pad axially leads said cutting edge of said inner insert toward said working end.

4,108,568
FAN ROTOR MEANS

Darold I. Townsend, 730 Cherry St., Cherokee, Iowa 51012

Filed Jun. 8, 1977, Ser. No. 804,546
Int. Cl.[2] F01B 3/02
U.S. Cl. 415—98 5 Claims



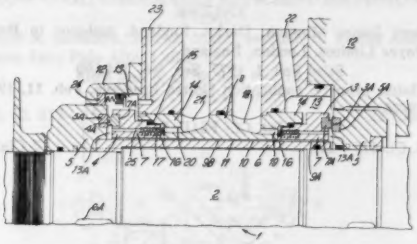
1. A rotor fan comprising,
a housing having first and second spaced apart opposing walls forming a first interior chamber,
a plurality of baffle members extending between said first and second walls and securely mounted in a generally perpendicular relationship thereto to form a cylindrical cage with said first chamber,
rotor blade means rotatably mounted within said cylindrical cage, said means comprising a plurality of interconnected blade elements longitudinally parallel to said baffle plates and extending from the inside edge of said baffle members toward the longitudinal center line of said cylindrical cage, said blade elements terminating prior to said center-line to form a cylindrical bore about said centerline,
means for rotating said rotor blade means,
an outlet tube extending from said interior chamber to the exterior to allow air flow out of said interior chamber,
air inlet means to introduce air into said bore to be propelled by said blade elements through said baffle member and out said outlet tube,
said baffle members being plates having first and second legs with the angle between said first leg and second leg being an obtuse angle and said baffle members being disposed between an securely attached at each end to a pair of ring shaped rims,
one of said rims securely mounted to the interior of said first wall and the other of said rims securely mounted to the interior of said second wall with said first leg of said plate being more or less tangential to the outer circumference of said rim and said second leg projecting inwardly therefrom.

4,108,569
LUBRICATED MECHANICAL SEALS FOR PUMPS

Michael Leslie Ryall, and James Rennie Robertson, both of Glasgow, Scotland, assignors to Weir Pumps Limited, Glasgow, Scotland

Filed May 26, 1976, Ser. No. 690,081
Claims priority, application United Kingdom, May 28, 1975, 23262/75
Int. Cl.[2] F04D 29/12; F16J 15/16, 15/40, 15/54
U.S. Cl. 415—112 5 Claims

1. In a machine installation having a rotary shaft extending through a through-bore in a wall of the installation, which wall bounds a high pressure environment of working fluid within the installation from a low pressure external environment; a high pressure shaft seal assembly to seal against the escape of working fluid through said through-bore to (a) the low pressure external environment, said shaft seal assembly comprising:
(a) a seal housing at said through-bore;
(b) a pair of axially spaced mechanical seals located in said seal housing, a first one of said seals being located nearer to the high pressure environment than the other second seal, each seal comprising rotor and stator portions with the stator portions of the seals located intermediate the rotor portions, the stator and rotor portions of each seal providing a sealing interface;
(c) means for urging the stator and rotor portions of each seal into sealing engagement at said sealing interface;
(d) an inner chamber for sealing medium located radially inwardly of each sealing interface;
(e) inlet duct means in the housing for the supply of high pressure sealing and lubricating fluid to the inner annular chamber of said first seal at a pressure above that of said

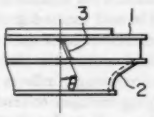


high pressure environment, said inlet duct means including conduit means in the stator portion of said first seal;
(f) passage means for directing sealing and lubricating fluid from said inner chamber of said first seal to the inner chamber adjacent the sealing interface of the second seal; and
(g) an elongate restriction clearance in said passage means to reduce the pressure of the sealing and lubricating fluid passing to the inner chamber of the second seal to a pressure which is relatively small amount above that of the low pressure external environment.

4,108,570
FRANCIS-TYPE RUNNER FOR PUMP-TURBINE

Masahiro Yamabe, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 23, 1976, Ser. No. 744,452
Claims priority, application Japan, Feb. 4, 1976, 51-10383
Int. Cl.[2] F01D 5/04
U.S. Cl. 416—186 R 1 Claim



1. A Francis-type runner for water pump-turbines comprising a crown ring, a shroud ring and a plurality of runner blades interconnected therebetween, each of said blades satisfying the following relations where $0.09 \leqq B/D \leqq 0.03$:

	$15° \leqq \theta \leqq 35°$
in the case where	$10° \leqq \gamma \leqq 19°$,
and	$20(\gamma - 12.3)/9° = \theta$
in the case where	$19° \leqq \gamma \leqq 28°$,

where
D = a diameter of a circle circumscribing the outer ends of the respective runner blades;
B = a height of the outer end of the runner blade between the crown ring and the shroud ring;
γ = an angle between the tangent at the outer end of the

runner blade to the curved surface thereof and the tangent at the outer end of the runner blade to the circle circumscribing the outer ends of the respective runner blades, both tangents being in a horizontal plane close to the crown ring; and

θ = an angle which the outer edge of the runner blade forms relative to a vertical plane passing through the center axis of the runner; whereby dual characteristics of operation showing a double efficiency are eliminated.

4,108,571

BLADED ROTOR ASSEMBLY FOR A GAS TURBINE ENGINE

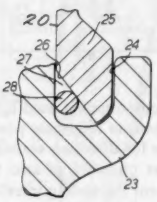
Robert James Mawson, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Feb. 1, 1977, Ser. No. 764,690

Claims priority, application United Kingdom, Feb. 11, 1976, 5335/76

Int. Cl.[2] F01D *5/32*

U.S. Cl. 416—221 **7 Claims**



1. A bladed rotor assembly for a gas turbine engine comprising: a plurality of blades each having a root portion, a blade carrying member having a plurality of slots in its periphery, each slot being arranged to receive and engage the root portion of one of said blades to radially retain the same to said blade carrying member, and lock members in engagement with said blades and said blade carrying member for preventing longitudinal movement of the root portion of each of the blades in the slots in at least one direction, at least one of the engagements comprising a projection defining an undercut and an edge of each of the lock members engaging in said undercut, said edge of each of said lock members having a chamfered edge which cooperates with a surface of said undercut to form a tapered groove therebetween having a section which reduces in a radially outward direction, and a wedging member separate from said lock members and from said undercut, said wedging member being mounted in said tapered groove and cooperating with both said chamfered edge of each of said lock members and said surface of said undercut so that in operation of the bladed rotor assembly centrifugal effects on said wedging member cause the wedging member to tend to move radially outward in the tapered groove to longitudinally wedge said edge of each of said lock members in said undercut against a wall of the same.

4,108,572

COMPOSITE ROTOR BLADE

Charles Elmore Platt, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1976, Ser. No. 753,742

Int. Cl.[2] F01D *5/14;* **F11D** *5/28*

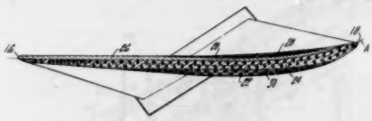
U.S. Cl. 416—230 **7 Claims**

1. A composite rotor blade of the type adapted for use in a turbomachine and having a leading edge, a pressure side and a suction side, the improvement comprising:

a core of high strength, high modulus fibers embedded in a metal matrix with the fibers extending in the spanwise direction through the blade;

a sheet of titanium adhered to the pressure side of said core and extending from the leading edge over approximately 75 percent of the blade chord;

a first laminate of crossply composite material of high strength, high modulus fibers embedded in a metal matrix



which is adhered to said titanium sheet in the midchord region of the blade; and

a second laminate of crossply composite material of high strength, high modulus fibers embedded in a metal matrix which is adhered to the suction side of said blade core.

4,108,573

VIBRATORY TUNING OF ROTATABLE BLADES FOR ELASTIC FLUID MACHINES

John T. Wagner, Upper Darby, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1977, Ser. No. 762,545

Int. Cl.[2] F01D *5/10*

U.S. Cl. 416—236 A **1 Claim**

1. A method for tuning an array of rotatable blades each having an airfoil portion with concave and convex surfaces which come together at leading and trailing edges and are disposed immediately downstream of an array of stationary blades, the method comprising the steps of:

providing ribs on the concave surface of the rotatable blades, the ribs being generally disposed parallel to the flow of fluid across the rotatable blades and extending from the trailing edge to the intermediate portion of the concave surface so that the trailing edge of the rotatable blades are tuned to vibrate at known frequencies, and

setting the number of stationary blades in the array of stationary blades at a number which will produce excitation at a frequency that will not correspond to the known frequencies of the trailing edge of the rotatable blades.

4,108,574

APPARATUS AND METHOD FOR THE INDIRECT MEASUREMENT AND CONTROL OF THE FLOW RATE OF A LIQUID IN A PIPING SYSTEM

Thomas S. Bartley, and Quinlan T. Rosenblath, Jr., both of Mobile, Ala., assignors to International Paper Company, New York, N.Y.

Filed Jan. 21, 1977, Ser. No. 761,214

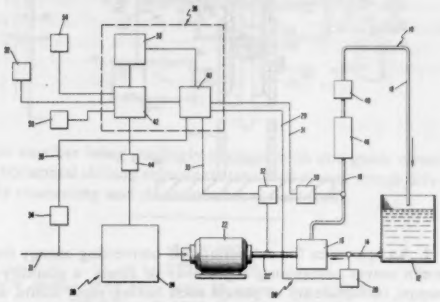
Int. Cl.[2] F04B *49/06, 49/08*

U.S. Cl. 417—19 **31 Claims**

1. Apparatus for continuously controlling the rate of flow of a liquid in a piping system in agreement with a desired flow rate, the apparatus comprising:

(a) a centrifugal pump;

(b) means for driving said pump, said driving means having a continuously variable speed capability;
(c) means for indirectly and continuously measuring the instantaneous rate of flow of the liquid in the piping system, said indirect measuring means including
(A) means for sensing at least two flow-related variables, said flow-related variables being associated with said pump and said driving means, said sensing means also including means for generating and transmitting signals representative of the instantaneous value of each of the sensed variables;
(B) calculating means including



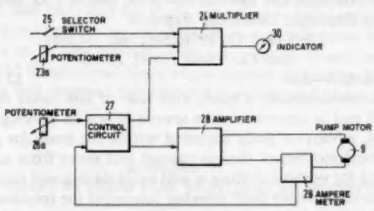
(i) memory means containing stored therein a set of mathematical relationships relating flow rate to said two flow-related variables,
(ii) converter means for receiving the transmitted signals and transforming the signals into a first converted signal representative of flow rate by use of the stored mathematical relationships, and
(iii) means for comparing a reference signal representing the desired flow rate with said first converted signal and for determining the error therebetween; and
(d) control means responsive to said error varying smoothly the speed of said variable speed drive means.

4,108,575

OBTAINING DESIRED FLOW RATE FROM ROLLER PUMP DESPITE VARYING THE HOSE MEANS

Wilfried Schäl, Bad Homburg-Dornholzhausen, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie K.G., Bad Homburg, Fed. Rep. of Germany

Filed Jun. 3, 1976, Ser. No. 692,373
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1975, 2535650
Int. Cl.[2] F04B *43/08, 43/12, 45/06*
U.S. Cl. 417—53 **2 Claims**



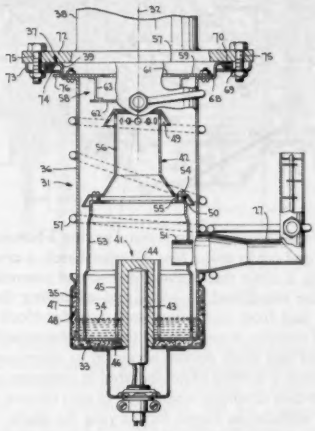
1. A method for operating a peristaltic roller pump so as to maintain a constant delivery rate of blood to a delivery port of an external blood circulatory system despite use of hose types of different diameters in the pump comprising the steps of: providing a first electrical signal representing the number of hoses used, providing a second electrical signal representing the diameter of the hose used, providing a third electrical signal representing the speed of a motor driving said roller pump, supplying said first, second and third electrical signals to analog computer means for calculating a flow rate representing signal from said first, second, and third electrical signals, displaying said flow rate representing signal, adjusting the motor speed signal in accordance with the displayed flow rate in order to obtain indication of a desired flow rate, and supplying the adjusted motor speed signal to the drive motor for driving said pump to produce the desired flow rate.

4,108,576

LOW COST, THERMALLY EFFICIENT DIFFUSION PUMP

Arthur A. Landfors, Sharon, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 6, 1976, Ser. No. 702,653
Int. Cl.[2] F04F *9/00*
U.S. Cl. 417—153 **22 Claims**



1. A diffusion pump for connection between a high vacuum chamber and a fore line leading to a fore pump comprising a body assembly including a cool cylindrical wall portion having a longitudinal centrally located axis, a pool of diffusion pump fluid at the bottom of the body assembly, a boiler for heating the fluid to a vapor state, a jet assembly concentric with the axis, a flow path for the vapor from the surface of the pool to the jet assembly, each jet assembly including at least one annular nozzle concentric with the axis for directing the vapor downwardly and outwardly against the cool wall portion, the cool wall portion condensing the vapor striking it into a liquid that flows downwardly along the cool wall toward the pool, an annular flange concentric with the axis and at the top of the body assembly for enabling the pump to be sealingly connected to the high vacuum chamber, a floor for confining the bottom of the pool, the body assembly having a wall segment for confining the periphery of the pool, a centrally disposed heating surface, the improvement being that the entire body assembly, including the cool wall portion, the wall segment, the flange and the floor are formed from a single piece of sheet metal deep drawn to: (1) have rounded corners between the wall segment and pool bottom as well as between the cool wall portion and the flange, (2) form the flange and floor, (3) form a downwardly depending annular flange connected to the floor by a rounded corner, the downwardly depending flange being formed by deep drawing the body assembly, the downwardly depending flange being bonded to the heating surface, said boiler including a cylindrical heating surface centrally located in the pool and extending axially from the bottom of

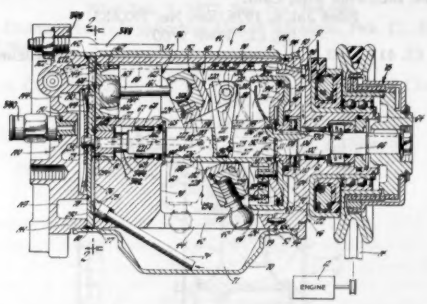
the pool to the surface of the pool, said surface being surrounded by a separator tube having openings close to the bottom of the pool so that liquid at the bottom of the pool enters an annular space between the separator and the heating surface close to the bottom of the pool and rises in the annular space while being heated to vaporization.

4,108,577

VARIABLE DISPLACEMENT COMPRESSOR

Byron L. Brucken, Miamisburg, and Dennis A. Black, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1977, Ser. No. 804,932
Int. Cl.[2] F04B *1/12*; F16H *23/00*
U.S. Cl. 417—222 **2 Claims**



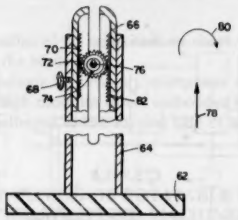
1. In A variable output compressor having a housing including a front end cover and a rear cylinder block, a crankcase in said housing, a drive shaft having its one end journaled in said rear cylinder block and its other end extending through an opening in said front end cover, said cylinder block having a plurality of cylinder bores formed therein substantially parallel to the axis of said shaft, pistons arranged to reciprocate in said cylinder bores, a wobble plate operated in response to rotation of said shaft and drivingly connected to said pistons, compressor output modulation means for varying the angle of inclination of said wobble plate relative to said drive shaft and thus the stroke of said pistons, said modulation means including an expansible hydraulic chamber actuator having an axially movable member for actuating said modulating means, an oil pump driven by said shaft, oil inlet passage means for conducting oil from said crankcase to the inlet of said pump, and oil outlet passage means for conducting oil from the outlet of said pump to said front end cover, the improvement comprising an axial protruding integral tubular extension on said front end cover outer surface surrounding said shaft other end, a front journal bearing on said shaft other end supported in said tubular extension, a radially extending passage in said front end cover having its outer end in communication with said oil outlet passage means, said expansible chamber actuator including a cup-shaped cylinder located in said housing adjacent said front end cover, said cylinder closed end having a forwardly extending tubular extension surrounding said shaft and fixedly secured thereto, whereby said cylinder is supported on said shaft in a concentric manner for rotation therewith, said axially movable member including a disc-shaped piston telescopically received in said cylinder rearwardly facing open end defining with said cylinder an expansible hydraulic chamber, an axially extending recess in the shaft portion surrounded by said cylinder tubular extension, said recess extending a predetermined distance beyond the forward and rearward ends of said cylinder tubular extension so as to define an axial open ended passage therewith providing fluid flow communication between the inner end of said radial passage and said expansible chamber; whereby said pump oil outlet passage means, including means for controlling flow of oil from said pump, is in communication with said expansible chamber for effecting movement of said disc-shaped piston and the resultant angle of inclination of said wobble plate.

4,108,578

RACK AND PINION WAVE MOTOR POWER PLANT

George Corey, 6340 Lankershim Blvd., N. Hollywood, Calif. 91606

Filed Aug. 24, 1976, Ser. No. 717,107
Int. Cl.[2] F04B *17/00, 35/00*; F16H *19/04*
U.S. Cl. 417—331 **7 Claims**



1. An apparatus for extracting and converting energy from ocean waves comprising a plurality of floats, a plurality of pumps, said plurality of pumps each having input shafts, said input shafts causing said pumps to convert oil from a low pressure state to a high pressure state when said input shafts are rotated, means to cause said input shafts to be rotated dependent upon the elevational heights of said plurality of floats, wherein said means to cause said input shafts to be rotated includes a plurality of shafts, one end of at least one of said plurality of shafts fixedly secured to a respective one of said plurality of floats, at least one rack, means whereby said rack is lockingly selectively secured to said at least one of said plurality of shafts along the length thereof, at least one pinion, a portion of the length adjacent the other end of said at least one of said plurality of shafts having the teeth of said rack continuously engaging the teeth of said at least one pinion, said pinion causing at least one of said input shafts to rotate as said at least one pinion is caused to rotate by the vertical displacement of said rack, and means to convert said oil to said high pressure state independent of the direction of vertical travel of each of said plurality of floats during a change in said elevational height, said plurality of floats being disposed bouyantly supported by a body of water, a motor, said motor being secured to a body of land, said body of land located adjacent said body of water, at least one pipe, said at least one pipe fluidly communicating said oil in said high pressure state to said motor.

4,108,579

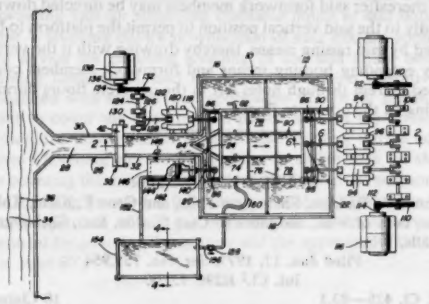
WAVE MOTOR

Antero Martinez, and Estrella Martinez, both of P.O. Box 1631, Santo Domingo, Dominican Republic

Filed Oct. 12, 1976, Ser. No. 731,566
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—333 **12 Claims**

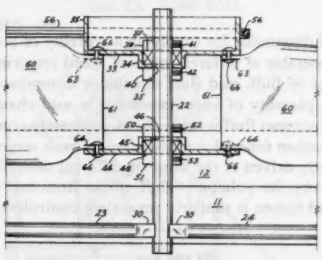
1. In combination, a basin, one side of said basin opening toward and in opposition to a source of waves moving theretoward, a buoyant body mounted within the basin for guided reciprocal movement therein toward and away from said one side and for vertical shifting in said basin during said reciprocal movement, a rotary shaft member journaled for rotation about a fixed axis, and drive means operatively connecting said body to said shaft member for driving the latter in response to reciprocation of said body in said basin, said body including at least one upstanding guide on the side thereof remote from said one side of said basin, said drive means including an elongated horizontal drive member, one end of said drive member including follower means captively engaged with said guide for

relative vertical shifting between said guide and follower means, stationary horizontal guide means, the other end of said



drive member being guidingly engaged with said guide means for horizontal shifting relative thereto, and pitman means drivingly connecting said drive member to said shaft.

4,108,580
ATTIC FANS
John V. Felter, P.O. Box 7464, Houston, Tex. 77008
Filed Dec. 8, 1976, Ser. No. 748,417
Int. Cl.[2] F04B *35/04*
U.S. Cl. 417—362 **19 Claims**



1. Fan apparatus, comprising a plurality of identical radially disposed equally circularly spaced elongate angular fan blades each having radially disposed opposite longitudinal edges, a stationary central shaft, first and second spaced plates each disposed substantially perpendicular to said shaft and rotatably fixed to said shaft, the inner end of each said fan blade extending angularly between said first and second plates and being connected to said first plate at the radially inner end of one of its said longitudinal edges and being connected to said second plate at the radially inner end of the other of its said longitudinal edges, and each said fan blade extending radially outward of said plates beyond said connections, one of said plates having means at its side opposite said connections of said inner ends of said longitudinal blade edges thereto for engagement by a drive belt disposed therearound to rotate said plates and blades about said shaft.

4,108,581
SUSPENSION SYSTEM FOR MOTOR-COMPRESSOR UNIT
Kenneth H. Miller, Syracuse, and Tadek M. Kropiwnicki, W. Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Jul. 26, 1976, Ser. No. 708,519
Int. Cl.[2] F04B *17/00*; F16F *15/00*
U.S. Cl. 417—363 **1 Claim**

1. In a suspension system for mounting a motor-compressor unit within a hermetically sealed shell, the improvement comprising:

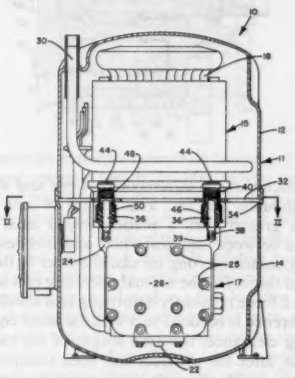
connecting means permanently secured to said shell;

anchoring means secured to said motor-compressor unit at approximately the center of gravity of the mass defined by said unit, including a plurality of rigid members spaced about a selected surface of said compressor of said unit;

individual spring means attached to each of said anchoring means and supported by said connecting means for yieldably suspending said unit within said shell;

a separate retaining member provided in spaced relation to each of said anchoring means; and

a resilient member disposed in said space between said retaining member and said anchoring means to substantially occupy the whole of said space when said motor-compressor unit is in a static state, the inner surface of said resilient



member being in intimate contact with the outer surface of said anchoring means, and the outer surface thereof being in contact with the inner surface of said retaining member, whereby said resilient member will be compressed between the opposed surfaces of said anchoring means and said retaining member to limit any motion of said motor-compressor unit in an angular direction about the horizontal axis of said unit, will be further compressed between opposed surfaces of said motor-compressor unit and said retaining member to limit motion of said motor-compressor in either vertically upward or downward directions within said shell, and will be further compressed between opposed surfaces of said anchoring means and said retaining member, and said retaining member and said motor-compressor unit to limit motion of said unit about the vertical axis of said unit.

4,108,582
CASING FOR GEAR PUMP OR MOTOR
Georges Bitton, Oullins, France, assignor to Rexroth-Sigma, Venissieux, France
Filed Dec. 6, 1976, Ser. No. 747,936
Claims priority, application France, Dec. 16, 1975, 75 38554
Int. Cl.[2] F04C *15/02*; B23P *15/00*
U.S. Cl. 418—132 **11 Claims**

1. A volumetric machine comprising:

a tubular casing having first and second axial ends, said casing having an inlet and outlet for working fluid;

first and second end plates closing said first and second casing ends respectively;

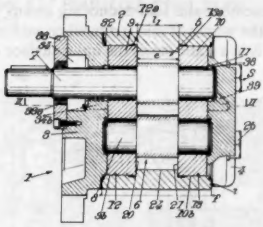
first and second rigid bearings received in said casing adjacent said first and second end plates respectively;

first and second meshing gearwheels each received in said casing between said first and second bearings; and

means for balancing each of said first and second bearings, said balancing means comprising a chamber defined be-

tween each said bearing and said adjacent end plate and means for admitting to each said chamber a fluid at a pressure increasing with a working pressure of said working fluid; said casing having an internal shoulder between said bearings, said shoulder having an axial length to limit the axial distance between the proximate faces of said bearings to a value greater than the axial length of each said gearwheel; in which machine the improvement comprises:

means for mechanically clamping said shoulder of said casing between said bearings and said end plates; said shoulder having an axial length in an unclamped condition



thereof such that the difference between said axial length of said shoulder and said axial length of each said gearwheel is greater than a predetermined axial operating clearance between said gearwheel and said bearings; said clamping means exerting on said shoulder in the clamped condition thereof in the normal operating condition of the machine a force resiliently deforming said shoulder so that said difference is reduced to a value at most equal to said operating clearance, the axial length of the casing being such that, after the shoulder has been clamped between the bearings, a clearance is left between each end face of the casing and the adjoining end plate.

4,108,583

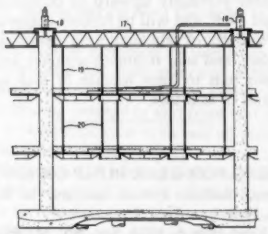
VERTICALLY MOVING SLIP FORMS

Peter Edington Ellen, Turramurra, Australia, assignor to Elspan International Limited, Causeway Bay, Hong Kong

Filed Dec. 6, 1976, Ser. No. 747,869

Int. Cl.[2] E04G *11/22*

U.S. Cl. 425—65 **1 Claim**



1. A formwork system comprising a platform adapted to be supported from vertical elements of a structure and being associated with raising means whereby it may be raised in relation to said vertical elements, the platform having a plurality of hollow vertically extending housing means depending from its underside, there being associated with each housing means at least one and up to five vertically spaced horizontal formwork members, the spacing being at distances corresponding to a storey height of the structure, each formwork member being hingedly attached to a housing means and being adapted to be moved from a vertical position in which it lies within the periphery of a corresponding housing means to which it is attached, to a horizontal position in which it can be attached to and supported by an adjacent housing means, said system being so arranged that when all said formwork members are in a horizontal position, concrete floors can be cast at each level and thereafter said formwork members may be directed downwardly to the said vertical position to permit the platform to be raised by said raising means, thereby drawing with it the vertically extending housing means and formwork members contained therein through holes left in the concrete floors during casting of the concrete floors.

4,108,584

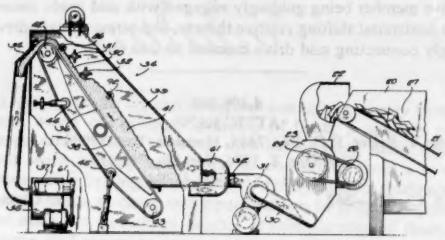
FLUFF DISTRIBUTOR

Edmund A. Radzins, Sheboygan Falls, and Gene F. Kiela, Kohler, both of Wis., assignors to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jan. 17, 1977, Ser. No. 759,954

Int. Cl.[2] B29C *13/00*

U.S. Cl. 425—83.1 **10 Claims**



1. A fluff distributor for supplying a plurality of converting machines operable at different rates of speed requiring different volumes of fluff, said fluff distributor comprising a fluff chamber, a plurality of vacuum screens in said chamber and onto which screens fluff is laid in batts, separately controllable drive mechanism for said screens whereby each screen can be independently driven at the same or different desired rates of speed whereby the volume of fluff output from said chamber for each said screen is similarly separately controllable.

4,108,585

APPARATUS FOR THE CONTINUOUS PRODUCTION OF FOAM PLASTIC BLOCKS OF RECTANGULAR CROSS-SECTION

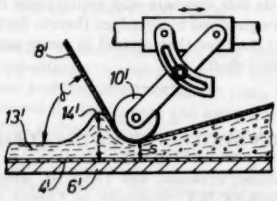
Ferdinand Proksa, Leverkusen; Reiner Raffel, Siegburg, and Ferinand Althausen Neunkirchen-Seelscheid, all of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Germany

Filed Jun. 24, 1976, Ser. No. 699,419

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1975, 2557572

Int. Cl.[2] B29D *27/04*

U.S. Cl. 425—89 **7 Claims**



1. In an apparatus for the continuous production of foam plastic blocks of rectangular cross-section comprising an endless conveyor belt whose upper run is provided with side walls,

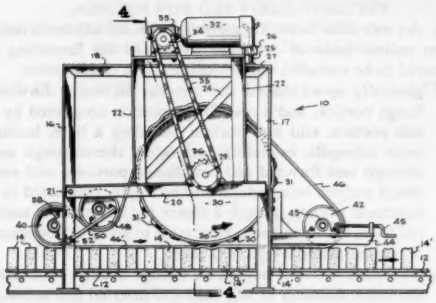
an unwinding unit adjacent said belt for supplying a bottom and side sheet for covering the upper run of the belt and the side walls, a mixture application device downstream of said unwinding unit for supplying foamable liquid to said bottom sheet, a levelling device downstream of said mixture application device for effecting levelling of the said liquid before foaming commences, and an unwinding station operatively associated with said mixture application device for feeding a sheet to cover the mixture as it passes beneath the levelling device, the improvement wherein said levelling device comprises a levelling means for providing a gap between the sheet for covering the mixture and the bottom sheet at the position of said levelling device and for causing a build-up of liquid immediately upstream of said gap, and wherein the angle between the sheet for covering the mixture and the upper run of the belt is at least 60°.

4,108,586

APPARATUS FOR FORMING IRREGULAR SHAPED BRICK

Lucius C. Gresham, Jr., Henderson, Tex., assignor to Henderson Clay Products, Inc., Henderson, Tex.

Division of Ser. No. 683,803, May 6, 1976, Pat. No. 4,078,038.
This application Aug. 29, 1977, Ser. No. 828,966
Int. Cl.² B28B *3/12*
U.S. Cl. 425—89 **7 Claims**



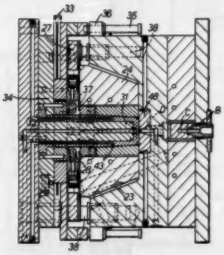
1. Apparatus for forming brick or the like of irregular configuration having a handmade appearance comprising a brick conveyor means, means for driving said brick conveyor means at a constant speed for feeding individual raw pliable brick members along a feed path, a flexible sheet member positioned above said brick conveyor means to engage the upper surface of brick members conveyed thereon, means for supporting and moving said flexible sheet member at the same speed and in the same direction as said brick conveyor means, force applying means for applying force through discrete portions of said flexible sheet member to press said discrete portions toward said brick conveyor means against and into any brick members on the brick conveyor means to effect a permanent deformation of said brick members without changing the relative positions of said brick members on said conveyor means, wherein said flexible sheet member comprises a horizontal flight of an elastic rubber-like belt loop and said means for supporting and moving said flexible sheet member includes upstream and downstream roller members supporting said horizontal flight of said belt loop so that said horizontal flight at least partially rests on the upper surfaces of brick members on said brick conveyor means.

4,108,587

PRODUCTION OF COMPOSITE CONTAINERS

Kenneth Francis Rumball, Great Bookham, England, assignor to Airfix Industries Limited, London, England

Filed Apr. 11, 1977, Ser. No. 786,573
Claims priority, application United Kingdom, Apr. 9, 1976, 14691/76
Int. Cl.² B29D *3/00*; B29F *1/00*; B29C *6/00*
U.S. Cl. 425—112 **13 Claims**



1. Apparatus for making a composite container from a planar blank of sheet material which includes an end panel and side panels each of which is foldable relative to the end panel from the planar condition to that position which it will occupy in forming the container, the apparatus comprising a core tool and a cavity tool which are movable relative to one another along a tool path between an open condition in which a blank in planar form can be positioned in a first location between the tools with the end panel intersecting said path and a closed condition in which the core tool is received by the cavity tool and in which the tools define a blank cavity in which they will clamp a blank between them with the panels folded to their relative final positions for forming the container and a mould cavity defining the shape of at least seam means for uniting edges of the blank juxtaposed by the folding of the panels,

injection means to inject mouldable material into the mould cavity,

blank guide means for positioning a blank in said first position and,

blank positioning means relative to which the tools are movable during relative movement toward the closed condition and which define a blank edge guide engageable by a blank edge during the folding and insertion of the blank into the cavity tool, to set that edge at a predetermined position relative to the mould cavity and positioned outside the path of the finished container during ejection of the finished container from the apparatus.

4,108,588

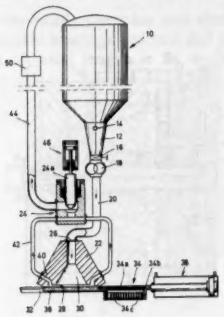
APPARATUS FOR PROCESSING MOLTEN LIQUID PLASTICS, PARTICULARLY FOR EXTRUSION OF PLASTICS

Rudolph Paul Fritsch, Stuttgart, Fed. Rep. of Germany, assignor to C.F. Scheer & Cie., Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 612,467, Sep. 11, 1975, Pat. No. 4,066,097.
This application May 4, 1977, Ser. No. 793,727
Int. Cl.² B29F *3/00*
U.S. Cl. 425—185 **4 Claims**

1. Apparatus for forming plastic melts into strands or filaments, comprising distributing means; delivery means to deliver plastic melt from a container to said distributing means; said distributing means including a chamber, an inlet in communication with said delivery means and said chamber to receive a plastic melt feed stream from said container for flow into said chamber, said chamber having a first outlet opening for the plastic melt to be formed, a closing member and an interchangeable member, said first outlet opening being closable with said closing member and being adapted to be in juxtaposition with one face of said interchangeable member,

said one face having a plurality of openings for passage of the plastic melt to be formed, guide means mounted to guide said closing member and said interchangeable member for sliding movement parallel to the plane of said first outlet opening and to positions juxtaposed with respect to said first outlet opening; said distributing means further including a back-flow line and valving means, and a second outlet communicating with said



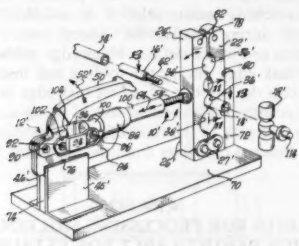
container via said back-flow line and said valving means for controlling the back-flow of the plastic melt to the container; and flushing means including a flow passageway communicating with said chamber at a point upstream of said first outlet opening, and in the immediate vicinity thereof, said passageway being connected with said second outlet via said valving means.

4,108,589

TOOL FOR FLARING PLASTIC PIPE

Robert E. Bunch, 2754 Arrow Hwy., Sp. 22, LaVerne, Calif. 91750

Continuation-in-part of Ser. No. 671,749, Mar. 30, 1976, abandoned. This application Jan. 21, 1977, Ser. No. 761,337
Int. Cl.[2] B29C *17/02*
U.S. Cl. 425—393 **3 Claims**



1. A tool for flaring the free end of plastic pipe and the like including a mandrel adapted to be inserted in the free end of the pipe to be flared and a flaring head operably mounted to the mandrel to engage the free end of the pipe, the improvement comprising:

a base operatively associated with said mandrel and flaring head and having an upstanding wall surface;

a first bar member engaging said upstanding wall surface;

a second bar member hingedly connected to one end of said first bar member;

removable hinge means operatively associated with said bar members and capable of hingedly connecting either desired pair of adjacent ends of said bar members, whereby said second bar member is adapted to be removably engaged with said first bar member; and

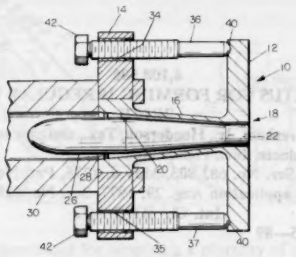
clamping means having an overcenter closure maintaining mechanism affixed to said base positioned to bear against said second bar member at a midpoint therealong for releasable engagement thereof with the first bar member, each of said bar members including a plurality of matching transverse notches disposed therein to form pairs which have predetermined non-semicircular arcuate walls sized to accommodate particular size pipes therebetween and to provide positive engagement between said notches and a plastic pipe arranged therein, whereby said mandrel disposed in said pipe is held from rotational and longitudinal movement by compression of said pipe thereon by a pair of said notches.

4,108,590

EXTRUSION HEAD

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 7, 1977, Ser. No. 766,323
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—466 **2 Claims**



1. An extrusion head for the formation of tubular articles from molten material furnished by means for furnishing a material to be extruded which comprises, in combination:

a generally spool-shaped die member having a forward flange portion, and a rear flange portion connected by a hub portion, said hub portion including a bore, having inner sidewalls, extending completely therethrough and through said forward and rear flange portions, said rear flange portion being adapted to be rigidly connected to a structural portion of such a means for furnishing a material to be extruded and connectable to allow introduction of molten material into said bore;

an extrusion mandrel having an outside diameter less than the inside diameter of said bore and inserted into substantially the entire length of said bore in facing relationship with said bore inner sidewalls;

means positioned adjacent said rear flange portion, for supporting said extrusion mandrel in said bore in a fixed location; and

means operatively associated with said forward flange portion for deflecting said forward flange portion and said connecting hub portion relative to said extrusion mandrel to correct out of concentric formation of said tubular article by physical distortion of said bore inner sidewalls relative to said fixed extrusion mandrel.

4,108,591

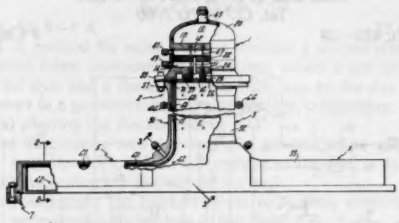
LASER COMBUSTOR APPARATUS

William J. Egan, Jr., Lake Park, and Lloyd M. Mazer, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,771
Int. Cl.[2] H01S *3/01*
U.S. Cl. 431—121 **6 Claims**

1. A laser combustor apparatus including an injector, a combustor and a transition manifold, said injector having a plurality of aligned chambers, an oxidizer chamber, a barrier

chamber, a fuel chamber, a coolant chamber, said coolant chamber having a porous wall, said wall facing said combustor, conduit means connecting said barrier chamber to said coolant chamber, restriction means for maintaining the pressure in said barrier chamber higher than the pressure in said



oxidizer and fuel chambers, second conduit means connecting said fuel chamber to said combustor through said porous wall, third conduit means connecting said oxidizer chamber through said barrier chamber and fuel chamber and directed through the center of said second conduit means to said combustor.

4,108,592

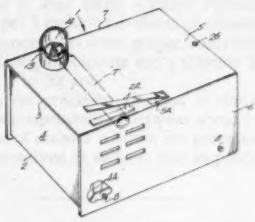
IGNITER FOR GAS FIRED TORCHES

Carl Fair, 316 SE. Pine, Roseburg, Oreg. 97470

Filed Oct. 28, 1976, Ser. No. 736,749

Int. Cl.[2] F23Q *3/00*

U.S. Cl. 431—128 **1 Claim**



1. A device for igniting gas fired torches, comprising in combination,

a housing,

electrical components located within said housing and including an arcing component projecting through a housing top wall to locate arcing electrodes exteriorly of said wall, said components including a switch having contacts closing a circuit to said arcing component,

a hood open at one side and disposed about the exterior portion of said arcing component, said hood serving to confine gas emitted from a torch tip for ignition purposes,

said hood in threaded engagement with the arcing component and serves to lock the same in place on said housing wall, and

an elongate control arm for said switch projecting outwardly through an opening in said wall and adapted for downward displacement by a torch tip to close said switch while the torch tip end is in register with the hood opening for ignition of the torch.

4,108,593

METHOD OF HEAT TREATING PULVERULENT OR GRANULAR RAW MATERIALS AND KILN PLANT THEREFOR

Soren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Oct. 27, 1976, Ser. No. 736,240

Claims priority, application United Kingdom, Oct. 27, 1975, 44073/75

Int. Cl.[2] F27B *15/00, 7/02*

U.S. Cl. 432—14 **7 Claims**

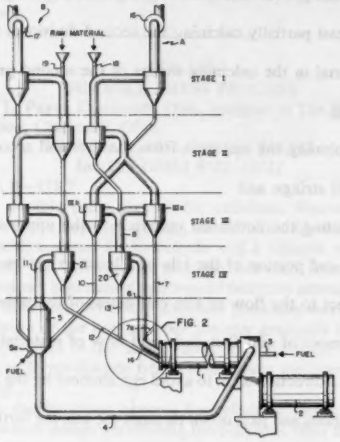


FIG. 2

1. A method for heat treating pulverulent or granular raw material in a plant including a kiln having an upper material inlet end portion and a lower material outlet end portion, cooling means communicating with the lower material outlet end portion of the kiln for cooling the material exiting therefrom, at least two multi-stage preheater strings, the first preheater string having a last stage, a riser pipe communicating the upper material inlet end portion of the kiln with the last stage of the first preheater string to direct hot kiln exit gases from the upper material inlet end portion of the kiln to the last stage of the first preheater string, calcining means connected to the second preheater string, means communicating said calcining means with said cooling means comprising:

(a) directing raw material to each of said multi-stage preheater strings;

(b) introducing hot kiln exit gases upwardly through the first preheater string so as to contact the raw material and effect heat exchange between the raw material and the hot kiln gases;

(c) introducing heated cooling air from the cooling means to the calcining means of said second preheater string to be used as combustion and preheating air;

(d) dividing the preheated raw material of the first preheater string into at least two divisional flows;

(e) controlling said first divisional flow so as to include substantially the maximum amount of raw material which can be substantially completely calcined exclusively by the kiln exit gases;

(f) directing said first divisional flow of raw material from the first preheater string generally toward the upper material inlet end portion of the kiln at a location and in a direction to cause said first divisional flow of material to be entrained within the hot gases exiting the kiln in the kiln riser pipe so as to be at least substantially completely calcined therein;

(g) directing the hot kiln exit gases and said entrained first divisional flow of material to the first preheater string;

(h) separating said at least substantially completely calcined

first divisional flow of material from the hot kiln exit gases;

(i) directing said second divisional flow of raw material from the first preheater string to the calcining means of the second preheater string to be combined with the raw material preheated in the second preheater string;

(j) at least partially calcining the second divisional flow of material in the calcining means of the second preheater string;

(k) combining the materials from the first and second preheater strings; and

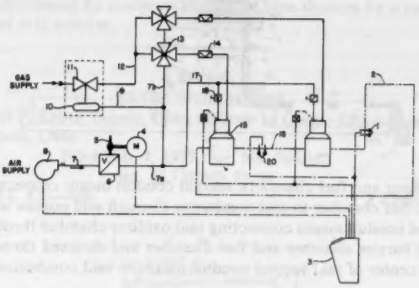
(l) directing the combined materials to the upper material inlet end portion of the kiln at a location upstream with respect to the flow of kiln exit gases, of the point of entrainment of said first divisional flow of material, and in such a direction so as to avoid entrainment by the hot kiln exit gases and pass down through the kiln for further heat treatment.

4,108,594

METHOD FOR FUEL/AIR FEED PRESSURE CONTROL BY STACK TEMPERATURE

Henry John Venetta, Warren; Raymond Edward Singrey, Williamsfield, and John Edward Coughlin, Youngstown, all of Ohio, assignors to Venetta, Inc., Warren, Ohio

Filed Dec. 6, 1976, Ser. No. 748,131
Int. Cl.[2] F27D 7/00
U.S. Cl. 432—24 3 Claims



1. A method of heating metal in a furnace comprising burning a compressed air and gaseous fuel mixture in a furnace and thereby heating the metal, flowing the hot exhaust gases to an exhaust stack, measuring the temperature of the gases as they are being exhausted, automatically controlling the pressure of the fuel-air mixture supplied to the furnace dependent upon the exhaust gas temperature, and reducing the pressure when excessive temperatures exist in the exhaust gas but maintaining a constant excessive fuel-to-air ratio at all times to provide a reducing atmosphere in the furnace.

4,108,595

METHOD FOR COLORING TEXTILE FABRICS AND FABRICS PRODUCED THEREFROM

Charles Pappas, Tiverton, R.I., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Continuation of Ser. No. 575,465, May 7, 1975, abandoned. This application Aug. 26, 1976, Ser. No. 718,450

Int. Cl.[2] D06P *7/00*

U.S. Cl. 8—1 A 15 Claims

1. A method for using a dye to simulate a printed effect in a flocked fabric composed of a substrate, which is not receptive to the dye, and a flock, which is receptive to the dye and is present in a predetermined design pattern, comprising:

(a) pleating the flocked fabric;

(b) distributing said dye onto the pleated fabric such that only the flock, which is receptive to the dye, is dyed;

(c) unpleating the flocked fabric; and

(d) subjecting the flocked fabric to fixation conditions to permanently fix the dye to the flock.

4,108,596

RECOVERY OF CHROMIUM VALUES FROM WASTE STREAMS BY THE USE OF ALKALINE MAGNESIUM COMPOUNDS

Donald C. Hemming, Whitesboro; Robert E. Hahn, Utica, both of N.Y., and John W. Robinson, Jr., Glen Mills, Pa., assignors to Revere Copper and Brass, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 595,147, Jul. 11, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,583

Int. Cl.[2] C14C *3/06;* C01G *37/00*

U.S. Cl. 8—94.27 7 Claims

1. A process for the recovery of chromium values from an aqueous solution containing same, comprising:

(a) contacting an acidic solution having a pH of up to about 4 and containing sulfate ion and containing trivalent chromium ion at a concentration of from about 0.1 to 20 grams of chromium per liter with an alkaline earth metal compound consisting essentially of a magnesium compound selected from the group consisting of magnesium oxide and magnesium hydroxide in an amount sufficient to neutralize the acidity of the solution to a pH of about 4 together with at least about 4 molar equivalents of said compound per 3 molar equivalents of trivalent chromium to form an amorphous solid, grainy, easily settleable chromium containing precipitate and a solution having a final pH of from 7 to 10; and

(b) separating the precipitate formed in step (a) from the solution at a temperature of between about 15° and 48° C.

7. The process of claim 1 wherein the precipitate separated in step (b) is redissolved in sulfuric acid to produce a leather tanning solution.

4,108,597

PROCESS FOR IMPARTING PUCKER AND COLOR EFFECTS TO FABRICS

Klaus Karl Mueller, Armonk, N.Y., and James Osborn E. Loughlin, Lubbock, Tex., assignors to Cotton Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 657,648, Feb. 12, 1976. This application Feb. 18, 1977, Ser. No. 769,886

Int. Cl.[2] D06M *1/08, 13/00*

U.S. Cl. 8—115 22 Claims

1. A process for imparting durable pucker and color effects to an undyed, dyed or printed, cured, polymer containing, crosslinked, cellulose-fiber containing durable press fabric composed of 100% cotton or of a blend containing at least 40% cotton fiber, which process comprises:

(a) applying an aqueous caustic solution containing 25 to 33.3% caustic soda by weight to the crosslinked fabric in selected areas thereof and also applying to said crosslinked fabric a surface active agent either as part of the said caustic solution or as a separate solution which is applied and dried prior to application of said caustic solution, said caustic solution being of sufficient concentration to destroy said polymer and cellulose crosslinks in said selected areas, said wetting agent being capable of causing said printing paste to penetrate the fibers of said crosslinked fabric in the absence of elevated temperatures, and said wetting agent being alkali resistant if applied as part of said caustic solution;

(b) allowing the caustic treated fabric to stand substantially at room temperature in a substantially tension-free state for from about 2 to about 20 minutes until said caustic treated portions have shrunk to produce flat uncrosslinked areas and contiguous unshrunk, puckered areas; and

(c) washing, neutralizing, rinsing and drying the puckered fabric.

4,108,598

DURABLE PRESS PROCESS

George L. Payet, Cincinnati, Ohio, assignor to The Strike Corporation, Cincinnati, Ohio

Filed Dec. 2, 1976, Ser. No. 746,743

Int. Cl.[2] D06M *9/12, 13/12*

U.S. Cl. 8—115.7 16 Claims

1. A durable press process for cellulosic fiber-containing fabrics which comprises treating the cellulosic fiber-containing fabric with aqueous formaldehyde and a catalyst capable of catalyzing the crosslinking reaction between formaldehyde and cellulose, heat curing said treated fabric by introducing the treated fabric into a heating zone and gradually increasing the temperature of the heating zone thereby gradually increasing the temperature of the heated fabric to prevent the loss of an amount of formaldehyde which will reduce the overall extent of curing.

10. A durable press process for cellulosic fiber-containing fabrics which comprises treating the cellulosic fiber containing fabric with aqueous formaldehyde and a catalyst capable of catalyzing the crosslinking reaction between formaldehyde and cellulose, heat curing said treated fabric by passing said treated fabric through zones of increasing temperatures to produce heat curing by gradually increasing the temperature of the treated fabric to prevent the loss of an amount of formaldehyde which will reduce the overall extent of curing.

4,108,599

HIGH WATER CONTENT EMULSION CLEANING

Miguel Coll-Palagos, Rye, and James H. Surridge, Stony Point, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 9, 1976, Ser. No. 647,960

Int. Cl.[2] B08B *3/00*

U.S. Cl. 8—137 17 Claims

1. A process for reclaiming and regenerating spent drycleaning solvent from an emulsion consisting essentially of an organic drycleaning solvent, water and a surfactant, said process comprising breaking said emulsion by electrolysis in the presence of an electrolyte or by con acting said emulsion with an effective amount of a demulsifying compound, and recovering said organic drycleaning solvent therefrom by distillation, wherein the organic drycleaning solvent and water in said emulsion are present in a ratio by volume of about 7:93 to about 95:5 parts of the water to the organic dry cleaning solvent.

4,108,600

FABRIC CONDITIONING ARTICLES AND PROCESSES

Louis Fay Wong, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 26, 1977, Ser. No. 791,079

Int. Cl.[2] D06L *1/16;* B05C *11/00*

U.S. Cl. 8—137 24 Claims

1. A fabric conditioning article especially designed for conditioning fabrics in a clothes washer and dryer comprising:

(A) a water-insoluble, closed receptable having at least a part of one wall comprising a porous material;

(B) an effective amount of a fabric conditioning composition in the form of individual or agglomerated particles, said particles being coated with a water-soluble/dispersible material and enclosed within the receptacle of (A); and

(C) an amount of a solid, particulate agent selected from the group consisting of electrolytes, pH control agents and mixtures thereof sufficient to make the coatings of (B) water-insoluble/indispersible in the volume of wash water in which they are used, said agent enclosed within the receptacle of (A);

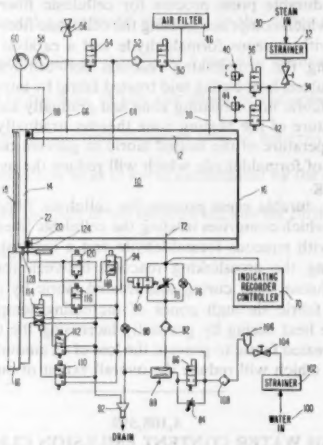
wherein the agent of (C) is physically separated from the particles of (B) within the receptacle of (A).

4,108,601

STEAM STERILIZING APPARATUS

Robert Wolff, Mantoloking, N.J., assignor to Better Built Machinery Corporation, Saddle Brook, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,440
Int. Cl.[2] A61L *3/00, 5/00*
U.S. Cl. 21—96 **5 Claims**



1. A sterilizing apparatus comprising:

(a) A sterilizing chamber having an open front, a back, and sides;

(b) A closed jacket encompassing said sides and permitting the circulation of steam peripherally about said sides;

(c) Door means mounted to said chamber and adapted sealingly to close the front of said chamber;

(e) First means interconnecting said jacket and said chamber for fluid communication and including first valve means for opening and closing said fluid communication;

(f) Second means automatically to open said first valve means at the commencement of the sterilizing in said chamber and closing said first valve means at the end of said sterilizing;

(g) Third means, including a low pressure line and a relatively high pressure line, connected in parallel with each other, connected to said jacket to supply steam to said jacket at two different pressures;

(h) Second valve means mounted in said high pressure line for controlling flow of steam therethrough; and

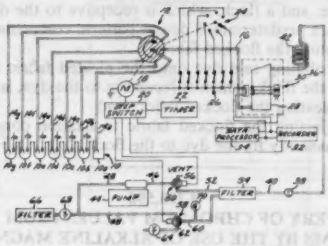
(i) Temperature sensitive means responsive to the temperature in said chamber and actuating said second valve means to supply steam at the relatively high pressure to said jacket until a predetermined temperature is reached and then closing said second valve means, and subsequently actuating said second valve means in response to a subsequent reduction in the temperature in said chamber.

4,108,602

SAMPLE CHANGING CHEMICAL ANALYSIS METHOD AND APPARATUS

William A. Hanson, Westlake Village, and Graham S. S. Barr, Canoga Park, both of Calif., assignors to Hanson Research Corporation, Northridge, Calif.

Filed Oct. 20, 1976, Ser. No. 734,089
Int. Cl.[2] G01N *1/14, 1/18*
U.S. Cl. 23—230 R **68 Claims**



1. A method of analyzing a liquid chemical sample which comprises the steps of:

(a) drawing a liquid chemical sample from a source thereof through a first fluid flow path into a flow cell of a chemical analyzer by application of partial vacuum to said flow cell through a second fluid flow path,

(b) analyzing said sample in said flow cell, and

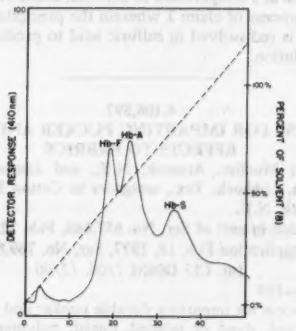
(c) forcing said sample from said flow cell back through said first flow path to said source by application of gas pressure to said second fluid flow path.

4,108,603

METHOD FOR RAPID ANALYSIS OF HEMOGLOBIN VARIANTS BY HIGH SPEED LIQUID CHROMATOGRAPHY

Frederick E. Regnier, West Lafayette, Ind., and Shung-Ho Chang, St. Louis, Mo., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed May 18, 1977, Ser. No. 798,135
Int. Cl.[2] G01N *31/08, 33/16*
U.S. Cl. 23—230 B **18 Claims**



1. A method for rapid analysis of hemoglobin variants by high speed liquid chromatography, said method comprising:

providing a bonded phase inorganic support at a separation area with said bonded phase being capable of separating predetermined hemoglobin variants;

passing hemoglobin variants through said separation area and into contact with said bonded inorganic support thereat to separate said predetermined hemoglobin variants; and

obtaining the profiles of said predetermined hemoglobin variants passed through said separation area.

4,108,604

ANALYTICAL METHOD FOR TNT IN WATER

Carl A. Heller, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 18, 1977, Ser. No. 816,225
Int. Cl.[2] G01N *21/06, 33/18, 33/22*
U.S. Cl. 23—230 R 8 Claims

1. A method for determining whether or not trinitrotoluene is present in water comprising the steps of:

A. allowing a sample of said water to flow over an ion exchange resin that is coated with a fluorescent dye; and

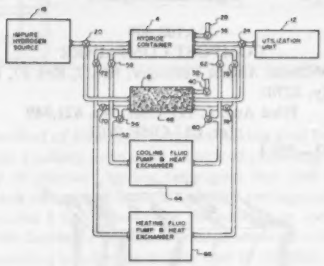
B. observing whether or not the fluorescence of the dye changes.

4,108,605

HYDROGEN PURIFICATION AND STORAGE SYSTEM

Roger E. Billings, Provo, Utah, assignor to Billings Energy Corporation, Provo, Utah

Filed May 4, 1976, Ser. No. 682,836
Int. Cl.[2] B01J *7/00, 8/02;* C01B *1/28*
U.S. Cl. 23—252 R 9 Claims



1. A system for purifying hydrogen for supply thereof to a hydrogen utilization unit comprising

first holding means,

a hydride forming alloy disposed in said first holding means and adapted to adsorb hydrogen and certain impurity gases when exposed to the hydrogen and certain impurity gases,

means for introducing a mixture of hydrogen and certain impurity gases into said first holding means to enable adsorbtion of hydrogen and some of said impurity gases by said hydride forming alloy held therein,

means for heating said hydride forming alloy in said first holding means to thereby cause said alloy to release either hydrogen or impurity gases previously adsorbed thereby,

means for conveying hydrogen from said first holding means to the hydrogen utilization unit,

first valve means coupled into said conveying means for controlling the conveyance of hydrogen from said first holding means to the utilization unit, and

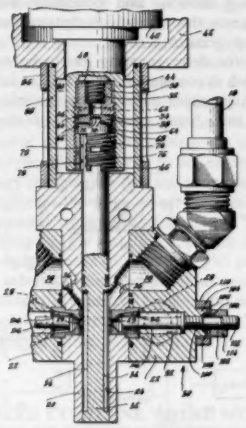
second valve means coupled into said first holding means for selectively enabling impurity gases released from said alloy to vent from said first holding means through said second valve means.

4,108,606

UNIVERSAL COUPLING FOR REACTION INJECTION MOLDING MACHINE

Robert Dean Wingard, Kent, Ohio, assignor to The Upjohn Company, Kalamazoo

Filed Dec. 22, 1976, Ser. No. 753,463
Int. Cl.[2] B29D *27/02;* F16D *3/04*
U.S. Cl. 23—252 R 10 Claims



1. A mixing head for a reaction injection molding machine comprising:

A. a body having

1. a bore which defines a mixing chamber;

2. a plurality of inlet conduits to said bore, and

3. a plurality of outlet conduits from said bore, each spaced axially from one inlet conduit,

B. a plunger mounted for relative axial reciprocal movement in said body bore between a recycle and an injection position having a plurality of by-pass channels, each of which provides fluid communication between one inlet and one outlet conduit when the plunger is in the recycle position,

C. axially reciprocable means mounted on said body for selectively moving said plunger between its recycle and injection positions, said reciprocable means being disposed for movement along an axis generally colinear to that of said plunger

D. a universal coupling linking said moving means and said plunger,

whereby slight non-colinearity of said plunger and said moving means is accommodated by said universal coupling to minimize the tendency for binding of the plunger in said bore due to said non-colinearity.

4,108,607

BLOOD GAS SIMULATOR

Bert David Pearson, Round Lake Beach, Ill., and Richard J. Kissane, Los Alamos, N. Mex., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 615,749, Sep. 22, 1975, abandoned. This application Jan. 30, 1976, Ser. No. 653,686
Int. Cl.[2] A61M *1/03;* G01N *31/00, 33/16*
U.S. Cl. 23—253 R 7 Claims

1. A system for use in evaluating the efficiency of a blood oxygenator, comprising:

(a) a deoxygenator means for deoxygenating a quantity of blood having a blood inlet, a deoxygenating gas inlet and a deoxygenating blood outlet;

(b) said deoxygenator including

(1) a hollow substantially upright mixing section having

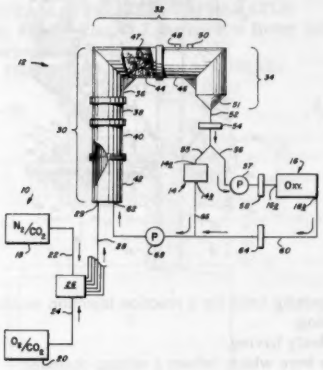
said blood inlet and said deoxygenating gas inlet in the lower portion of said section;

(2) a hollow substantially transversely oriented defoaming section connected with said mixing section for receiving blood which has been mixed with said gas and wherein said mixture is defoamed; and

(3) a hollow collection section connected with said defoaming section for receiving defoamed blood from said defoaming section, said collection means including outlet means through which deoxygenated blood exits said deoxygenator;

(c) a source for deoxygenating gas to be mixed with said blood which is connected with said gas inlet;

(d) a blood oxygenator means having an inlet and an outlet, with said inlet being connected with the outlet of the



deoxygenator means so that deoxygenated blood is directed into said oxygenator means, and with said oxygenator means outlet being connected with said deoxygenator means blood inlet for directing oxygenated blood to said deoxygenator means;

(e) sampling and testing means communicating with said oxygenator means for obtaining and testing samples of the blood entering said oxygenator means and exiting said oxygenator means for determining the efficiency of a blood oxygenator;

(f) an overflow reservoir connected with said deoxygenator blood outlet for receiving from said deoxygenator, blood in excess of the capacity of the oxygenator means; and

(g) conduit means connected with said reservoir and deoxygenator means for returning said excess blood to said deoxygenator means.

4,108,608

DILUTING AND DISPENSING PROBE FOR BLOOD SAMPLE PREPARATION

Francis William Maher, Jr., Milford, and Vladimir Valentine Pirc, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 669,015, Mar. 22, 1976, Pat. No. 4,016,828. This application Jan. 13, 1977, Ser. No. 758,999

Int. Cl.[2] G01N *1/14*

U.S. Cl. 23—259 **4 Claims**

1. A sampling probe for diluting and dispensing a blood sample comprising:

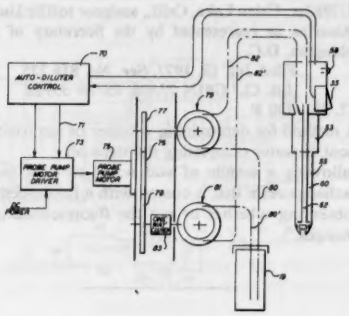
a. coaxially disposed hollow cylindrical members defining sample and diluent conduits;

b. a mixing region in flow communication with said conduits;

c. an outlet and an inlet duct placing said mixing region in flow communication with the exterior of the probe;

d. first and second reversible positive displacement pumps each having respective flow means constituting fluid intakes and fluid discharges when operating in a forward direction and visa versa in reverse direction;

e. flow coupling means connecting the forward direction fluid intake means of both said pumps to a source of diluent and each of the forward direction fluid discharge flow means to one of said probe conduits, said pumps and flow coupling means being normally filled with diluent in operation;



f. a reversible motor drive means and gearing coupling said motor to said pumps; and

g. a one way clutch disposed between said drive means and one of said pumps having its forward operation discharge flow means connected to said diluent conduit of the probe, said clutch being oriented to render said one pump inoperative during reverse operation of said pump drive motor.

4,108,609

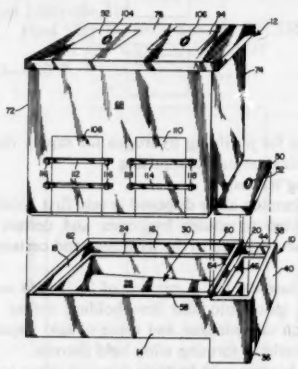
COMPOST CONTAINER

Manfred Wilhelm August Petzinger, Rte. 7, Box 87, Elizabethtown, Ky. 42701

Filed Aug. 4, 1977, Ser. No. 821,849

Int. Cl.[2] C05F *9/02*

U.S. Cl. 23—259.1 **7 Claims**



1. A compost container including:

a. a base section, including side, end and bottom walls, providing a first housing to receive fertilizer sap, collecting means for receiving the fertilizer sap, and access means in said collecting means for permitting selective removal of the fertilizer sap therefrom,

b. an upper section mounted on said base section providing a second housing to receive decomposable garbage and waste, said upper section including side, end and first top walls providing said second housing, and grill means placed across the corners of the second housing between

the side and end walls thereof to prevent the accumulation of garbage and waste in the corners of the second housing and to permit circulation of air in the second housing,

c. a floor between said base and upper section for supporting the decomposable garbage and waste,

d. said floor having means for permitting fertilizer sap to gravitate from the upper section to the base section, and

e. access means in said upper section to permit decomposable garbage and waste to be added to, and removed from, the second housing.

4,108,610

METHOD OF AND APPARATUS FOR COMPACTING COKING COAL

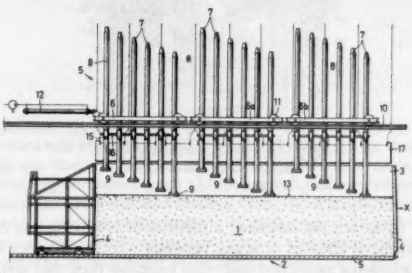
Kurt Leibrock, Fürstenhausen, Fed. Rep. of Germany, assignor to Saarbergwerke Aktiengesellschaft, Bochum, Fed. Rep. of Germany

Filed Feb. 1, 1977, Ser. No. 764,697

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2603954

Int. Cl.[2] C10L *5/00*; B30B *11/00*

U.S. Cl. 44—10 G **12 Claims**



1. In a method of forming a compact coking coal body to be charged into a coking oven in an elongated pounding box with a plurality of punners having respective feet and mounted adjacent each other in at least one punner carriage adapted to be reciprocated lengthwise of the pounding box, the steps of continuously feeding a predetermined amount of coking coal into the pounding box for the coking coal to establish an upper surface therein; raising and lowering the adjacent punners in the same punner carriage in a timed alternate succession at least during said feeding step; and so reciprocating the punner carriage during said raising and lowering step that the feet of the punners contact the upper surface of the coking coal over respective contact regions which overlap each other at least to an extent sufficient for two of the punners of the same punner carriage to substitute for the punner situated therebetween in the event of malfunction of the latter.

7. Apparatus for forming a compact coking coal body to be charged into a coking oven, comprising an elongated pounding box; at least one punner carriage mounted for reciprocation longitudinally of said pounding box; a plurality of punners mounted on said punner carriage for reciprocation therewith and for movement relative thereto along substantially vertical paths and having respective feet; means for moving said punners relative to said punner carriage at least while a predetermined amount of the coking coal is being continuously fed into said pounding box to establish an upper surface therein; and means for so simultaneously reciprocating said punner carriage that said feed of said punners contact the upper surface of the coking coal over respective contact regions which overlap each other to an extent sufficient for two of said punners to substitute for the punner situated therebetween in the event of malfunction of the latter.

4,108,611

PLASTIC FUEL, PRODUCTS MADE THEREFROM AND A NOVEL METHOD FOR STARTING AND PROMOTING FIRES USING THE FUEL

Myrna R. Youdelman, 7 Tennyson St., Hartsdale, N.Y. 10530

Filed May 14, 1973, Ser. No. 359,907

Int. Cl.[2] C10L *11/00*; C06F *3/02*

U.S. Cl. 44—38 **3 Claims**

1. A method for initiating and promoting a friendly fire, which comprises directly contacting a primary source of combustible fuels with a piece of cast, bulk polymerized solid acrylic plastic polymer of a monomer selected from the group consisting of lower alkyl esters of alkacrylic acids and lower alkyl esters of acrylic acid, the acrylic plastic being of a size and shape designed and adapted to be readily contacted with the primary source of fuel and igniting the acrylic plastic, whereby the acrylic plastic burns to an extent sufficient to ignite said primary combustible fuel and promote a friendly fire therewith and wherein the piece of acrylic plastic has a minimum major dimension of about 2 inches.

2. A match comprising a matchstick, which in turn is comprised of an elongated piece of a solid acrylic plastic polymer of a monomer selected from the group consisting of lower alkyl esters of alkacrylic acids and lower alkyl esters of acrylic acid, and a match head, formed at one end of the matchstick, comprising a material which is ignitable by friction.

4,108,612

DERIVATIZED ETHYLENE/POLAR MONOMER POLYMERS OF IMPROVED PERFORMANCE

Albert Rossi, Warren, and Harold N. Miller, Millington, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

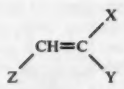
Filed Apr. 4, 1977, Ser. No. 784,121

Int. Cl.[2] C10L *1/14*

U.S. Cl. 44—62 **9 Claims**

1. A fuel oil composition of improved low temperature flow properties which comprises a major proportion of a middle distillate fuel and about 0.005 to 0.15 weight percent of a low temperature flow improver which is a copolymer which has been chlorinated so as to contain between about 5 to 25 wt. % chlorine, said copolymer having a number average molecular weight in the range of about 1500 to 20,000, said copolymer being improved in its flow improving properties by said chlorination, said copolymer consisting essentially of about 75 to 95 mole % of ethylene and at least one polar free-radical polymerizable comonomer selected from the group consisting of:

vinyl alcohol carboxylic acid esters, acrylates, α-alkyl acrylates, itaconates, maleates, fumarates, all of the general formula:



wherein,

Z is a hydrogen atom or —COOR′;

X is a hydrogen atom or a C_1 to C_8 alkyl group;

Y is a —OOCR or —COOR′ group;

R is a hydrogen atom or a C_1 to C_8 alkyl group; and

R′ is a C_1 to C_8 hydrocarbyl group.

4,108,613

POUR POINT DEPRESSANTS

Kenneth A. Frost, Jr., San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 29, 1977, Ser. No. 837,798

Int. Cl.[2] C10L *1/22*

U.S. Cl. 44—62 **11 Claims**

1. A material useful as a pour point depressant for hydrocarbonaceous fuels and oils comprising a mixture of:

(1) the reaction product of an epoxidized alpha-olefin containing from 14 to 30 carbon atoms and a nitrogen-containing compound selected from ammonia, an amine, a polyamine, or a hydroxyamine; and

(2) an ethylene-olefin copolymer having a molecular weight in the range 1000 to 100,000.

4,108,614

ZIRCONIUM LAYER FOR BONDING DIAMOND COMPACT TO CEMENTED CARBIDE BACKING

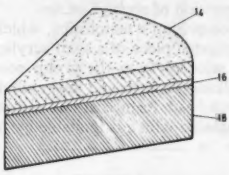
Robert Dennis Mitchell, 713 Balnagafk, Cnr. Banket & Paul Nel, Hillbrow, Johannesburg, South Africa

Filed Mar. 31, 1977, Ser. No. 783,312

Claims priority, application South Africa, Apr. 14, 1976, 76/2258

Int. Cl.[2] B24D *3/06*

U.S. Cl. 51—295 **5 Claims**



1. An abrasive body comprising a diamond compact bonded to a cemented carbide backing by means of a continuous zirconium layer, the thickness of which is less than 0.5 mm, the diamond compact being substantially free of graphite and having a bonding matrix selected from a metal of Group VIII of the Periodic Table and an alloy containing one or more such metals and at least 70 percent by volume of diamond particles, and the cemented carbide backing being selected from cemented tantalum carbide, cemented tunsten carbide and cemented titanium carbide and mixtures thereof.

4,108,615

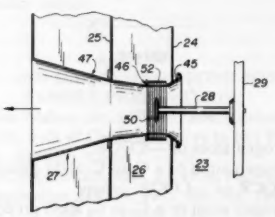
VANED ANODE FOR HIGH-INTENSITY IONIZER STAGE OF ELECTROSTATIC PRECIPITATOR

Dale J. Satterthwaite, Bellevue, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 7, 1977, Ser. No. 785,469

Int. Cl.[2] B03C *3/00*

U.S. Cl. 55—2 **10 Claims**



1. The method of preventing particulate deposition on the walls of a venturi diffuser which acts as the anode in a co-axial high-intensity ionizer wherein particulate-laden gases pass through a high-intensity corona discharge maintained within the throat region of said venturi comprising the steps of:

providing a source of particulate-free gas; and

injecting said particulate-free gas into the throat region of said venturi interior in a substantially laminar flow along the wall thereof substantially the same direction as said particulate-laden gas stream whereby said particulate-laden gas stream is enveloped within said particulate-free gas stream.

4,108,616

LIQUID-GAS PHASE SEPARATION FOR SELF-CONTAINED LIQUID METAL CURRENT COLLECTORS

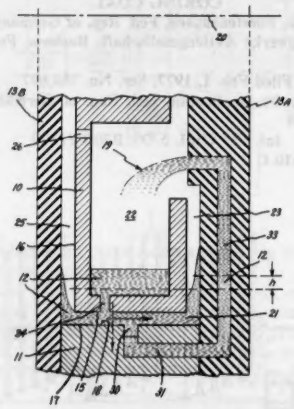
Burton D. Hatch, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 625,130, Oct. 23, 1975, Pat. No. 4,027,183.

This application Feb. 10, 1977, Ser. No. 767,372

Int. Cl.[2] B01D *19/02;* **H02K** *13/00*

U.S. Cl. 55—48 **6 Claims**



1. In an acyclic machine, a method of removing gas from liquid metal situated in a gap between a rotor collector ring and a housing encircling said rotor collector ring, said method comprising:

rotating said rotor collector ring so as to impart tangential velocity to the liquid metal in said gap;

conducting liquid metal from said gap to a chamber contained in, and rotating with, said rotor collector ring;

collecting in said chamber the liquid metal conducted thereto;

drawing off, at a radially-inward location in said chamber, displaced gas having floated to the surface of the liquid metal in said chamber; and

returning liquid metal, from which entrained gas has been separated, to said gap through an opening at a radially-outward location in said chamber.

4,108,617

DUAL FILTER ASSEMBLY

Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corp., Salem, Va.

Filed Feb. 7, 1977, Ser. No. 766,437

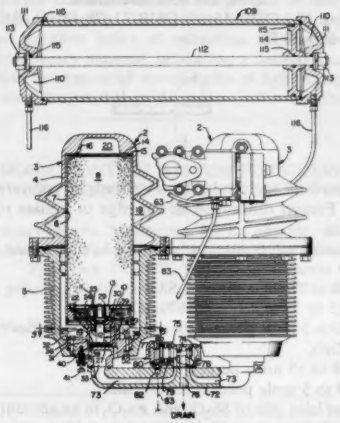
Int. Cl.[2] B01D *53/00*

U.S. Cl. 55—162 **11 Claims**

1. A filter assembly for compressed gas comprising a pair of filter units connected to a source of unfiltered compressed gas for receiving said gas therefrom, control means for alternating said gas from said source between said filter units, each of said units containing a desiccant, means for alternating each unit between filtering and purging cycles for respectively adsorbing a contaminant from said gas by and regenerating said desiccant, and a purge tank containing a floating piston and divided thereby into a pair of compartments each connected to an outlet of a different one of said units, each of said compartments alternately storing filtered gas from the outlet of the connected filter unit during a filtering cycle thereof and during a purging cycle thereof and under gas pressure from said other

compartment discharging said stored gas back to said connected unit for reverse-flow purging of said desiccant therein.

5. A filter assembly for compressed gas comprising a pair of filter units, each having an inlet for receiving compressed gas, a desiccant in said filter unit, inlet valve means for alternately opening said inlets and directing said compressed gas therethrough to said filter units for alternate filtering thereby, each of said units alternating between filtering and purging cycles

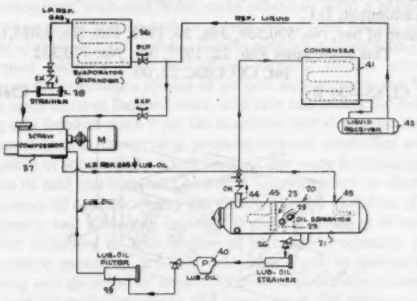


for respectively adsorbing a contaminant from said gas by said desiccant and regenerating said desiccant by a reverse flow of purge gas therethrough, each unit having a single drain for discharging therefrom both said purge gas and non-adsorbed contaminants accumulated therein, drain valve means for closing and opening said single drain of each unit while said inlet thereof is respectively opened and closed, and means for delaying opening of said drain valve means of each unit until said inlet thereof is closed.

4,108,618
ANTI-FOAM CHAMBER FOR SCREW COMPRESSOR OIL SEPARATOR

Anthony C. Schneider, Etters, Pa., assignor to Freezing Equipment Sales, Inc., York, Pa.

Filed Feb. 23, 1977, Ser. No. 771,353
Int. Cl.[2] B01D *19/02*
U.S. Cl. 55—178 **1 Claim**

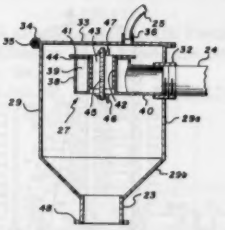


1. In a multi-compartment oil-gas separator which comprises a shell, an oil-gas inlet, a gas outlet, an oil outlet and other connecting means, the improvement comprising an anti-foam chamber comprising a curved wall member, a portion of the oil-gas separator shell wall itself, connecting parallel plates which form and close the ends of the anti-foam chamber, open ended liquid and gas equalizing legs, said liquid equalizing leg being connected to the bottom side of the curved wall member terminating at a point adjacent to the bottom of the oil-gas separator shell, said gas equalizing leg connected to the top side of the curved wall member with the other end of the equalizing leg open and terminating at a point adjacent to the top of the oil-gas separator shell, the anti-foam chamber having view ports mounted through the oil separator shell wall, said anti-foam chamber disposed within the oil separator shell, downstream of the oil-gas inlet and upstream of the gas outlet.

4,108,619
DEGASSER SPRAY VESSEL

Victor Quin Phillips; Phil Harmon Griffin, and Martin James Sharki, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 754,856, Dec. 27, 1976, abandoned.
This application Feb. 8, 1978, Ser. No. 876,282
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—192 **9 Claims**



1. In a system for separating gas from liquid, the combination comprising:

a peripheral wall section forming a vessel;

a top sealably secured to said peripheral wall section;

a lower vessel section closing the bottom of said peripheral wall section;

inlet means connected to said vessel;

outlet means connected to said lower vessel section and located below said inlet means, said outlet means including means for allowing said gas and liquid to exit from vessel and blocking entrance of gas into said vessel; and

spray deflector means in said vessel, connected to said inlet means, arranged to spray a radial spray pattern against the inner wall of said vessel, said spray deflector means including vacuum creating means for creating a vacuum in said vessel wherein said vacuum creating means includes an opening extending through said spray deflector means thereby providing open communication between said lower vessel section and said vessel.

7. A closed system for the separation of a substantial amount of entrapped gas from a fluid such as drilling mud, comprising:

a generally vertical enclosed vessel having a sealed top and bottom;

fluid inlet means passing through a wall of said vessel into the interior thereof;

fluid discharge means in the lower portion of said vessel, said fluid discharge means including means for allowing said gas and fluid to exit from said vessel but preventing gas from entering said vessel; and

a spray assembly located inside said vessel and adapted for emitting a radial outward spray pattern against the inside of the vessel wall, said spray assembly comprising an annular chamber having two concentric vertical walls and an annular bottom plate with a central opening therethrough and a deflector having a flat annular plate and an open central spool attached thereto, said deflector plate being in close proximity to the top of said vertical walls and forming an annular gap with the outer wall, said spool

arranged for close-fitting relationship with said inner vertical wall, with open gas communication from above said spray assembly to below said spray assembly through said central opening thereby providing means for creating a vacuum within said vessel.

4,108,620

DEVICE FOR THE SEPARATION OF GASEOUS MIXTURES INTO COMPONENTS OF DIFFERENT MOLECULAR MASS

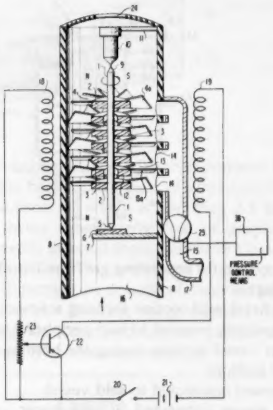
Gotthold Bohme, Oberursel; Erich Robens, Friedrichsdorf; Horst Binder, Karben-Petterweil, and Dieter Langbein, Bad Homburg, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 26, 1976, Ser. No. 680,083

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1975, 2518201

Int. Cl.[2] B01D *45/14*

U.S. Cl. 55—210 **12 Claims**



1. A device for separation of gaseous mixtures into components of differing molecular mass, comprising:

(a) a generally cylindrical stationary casing having a gaseous mixture inlet and at least two gas outlets for the separated gas components;

(b) a rotor axle mounted within said casing coincident with its longitudinal axis;

(c) a plurality of spaced apart rotor discs attached to said rotor axle and extending radially therefrom, each of said rotor discs having blades at their periphery and at least two said rotor discs being formed of magnetic material;

(d) a plurality of spaced apart stator discs attached to the interior of said casing, extending radially inwardly between said rotor discs;

(e) an electrical power source;

(f) current amplification and retification means connected to said power source and to an electrical coil;

(g) said electrical coil being connected to said electrical power source and disposed adjacent the exterior of said housing such that electrical current passing through said coil generates a magnetic moment in said rotor discs of magnetic material so as to rotate said rotor axle and said rotor discs;

(h) delivery tube means connected to one of said at least two gas outlets; and

(i) control means connected to said delivery tube means and which keeps the total pressure in the gaseous mixture below 10 Pa.

4,108,621

PROCESS OF PRODUCING SOFT APERTURE FILTER

Yoshiyuki Asahara, Higashiyamato, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo

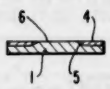
Filed Dec. 16, 1976, Ser. No. 751,300

Claims priority, application Japan, Dec. 19, 1975, 50/152251

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.[2] C03C *15/00*; C03B *11/08*; C03C *19/00*

U.S. Cl. 65—30 R **6 Claims**



1. A method for producing a soft edged aperture filter to prevent Fresnel diffraction at the edge of a glass rod which comprises

a. diffusing silver into a glass plate having a base composition comprising

i. 55 to 72 mole percent SiO_2,

ii. 15 to 35 mole percent Na_2O,

iii. 0 to 5 mole percent divalent oxide or oxides other than ZnO,

iv. 4 to 15 mole percent ZnO,

v. 0 to 5 mole percent Al_2O_3, and

vi. at least one of Sb_2O_3 and As_2O_3 in an amount of 2 to 5 weight percent of the base composition

with a fused bath containing at least one silver salt in an amount of 14 to 60 mole percent, said glass plate having on a first surface thereof a glass projection portion which does not extend to any side of the glass plate, wherein said diffusion is into the projection and into said first surface and bottom surface of the plate, and subsequently

b. removing said glass projection portion down to said first surface having said diffused silver without disturbing said first surface and removing the diffused bottom surface, to thereby provide a light transmittance gradient arranged in a circle on the glass plate, the gradient being a lowering of the light transmittance between the first and bottom surfaces of the glass plate in the radial direction from the inner to the outer portion of the circle.

4,108,622

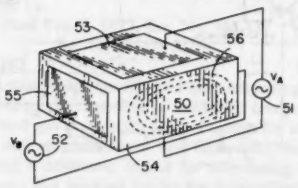
METHOD OF MAKING MINIATURE COUPLING LENS

William E. Martin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 590,539, Jun. 26, 1975, Pat. No. 4,025,157. This application Feb. 22, 1977, Ser. No. 770,332

Int. Cl.[2] C03C *21/00*

U.S. Cl. 65—30 R **7 Claims**



1. A method of fabricating a miniature optical lens for coupling determinable wavelengths of light energy from the emitting surface area of a source having a known index of refraction comprising:

selecting a semiconductor material transparent to said deter-

minable wavelengths of light energy and having an index of refraction substantially matching that of said source;

shaping said material to a configuration of pairs of parallel rectangular flat surfaces of maximum dimensions less than one hundred microns including at least one such surface substantially the same in size and shape as said emitting surface area;

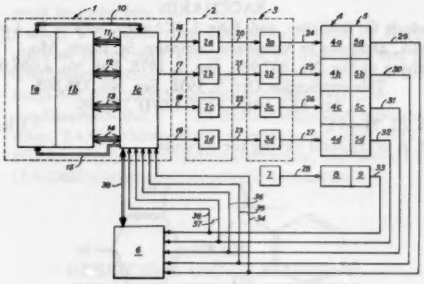
inducing gradual variation in the composition of said semiconductor material between at least one of said pairs of parallel rectangular flat surfaces for causing a predetermined gradient index of refraction thereacross in said semiconductor material, producing a desired focal length for said determinable wavelengths of light energy along on axis orthogonal to said gradient index of refraction.

4,108,623

ELECTRONIC CONTROL SYSTEM FOR GLASSWARE AND OTHER THERMOPLASTIC ARTICLES FORMING MACHINES

Luis Cardenas-Franco, Monterrey, N. L., Mexico, assignor to Investigacion Fic Fideicomiso, Monterrey, N.L., Mexico

Filed Oct. 18, 1977, Ser. No. 843,200
Claims priority, application Mexico, Jun. 6, 1977, 169360
Int. Cl.[2] C03B *9/40*
U.S. Cl. 65—163 **15 Claims**



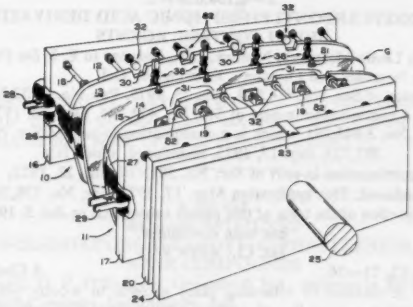
1. An electronic control system for glassware or other thermoplastic articles forming machines of the kind having at least one unitary forming section comprising glass gob feeding and distribution means; glass gob guiding channel means for guiding said gobs from said feeding and distribution means; a blank forming station having blank mold means to receive glass gobs from said guiding channel means and parison formimg means to cooperate with said blank mold means to form a parison; a blow molding station and/or a take out station having closeable split blow mold means, transfer means for transferring said formed parisons from said blank forming station, blowing means for injecting a stream of air into said parisons and blow the same to form finished ware, and take out means for removing said finished ware from the machine; said electronic timing control system comprising preprogrammed controller means capable of sequentially controlling all the ware forming operations of said machine, and having a fixed memory to store the sequence of operations and the timing of fixed variables of said sequence and a floating memory to store the timing of certain other variables of said sequence; constant frequency pulse generator means to act as a real time clock to measure the timing and duration of each operation sequentially controlled by said controller means in real times; glass gob release sensor means to detect the instant when a glass gob is cut and released from said glass gob feeding and distribution means and feedback a signal to said controller means for triggering the initiation of a ware forming cycle of the machine; temperature sensor means to detect the passage of a glass gob from said guiding channel means to said blank mold means and feedback a signal to said controller means for timely controlling the removal of said guiding channel means and the introduction and initiation of the operation of said parison forming means in intimate relationship with actual arrival of a glass gob into said blank mold means; pressure sensor means to detect the instant when said parison forming means commence to work on a glass gob and feedback a signal to said controller means for triggering the time count of the remaining ware forming operations; and operator panel means having digital switch means for feeding a timetable subprogram to said floating memory, variable frequency oscillator means for simulating the feedback signal from said glass gob release sensor means when said feedback signal is absent, and mode of operation selector switch means for selecting a mode of operation from at least manual operation of the main mechanisms of the machine, test operation without a glass load in the machine, and automatic operation with a glass load in the machine.

4,108,624

SUPPORTING A GLASS SHEET FOR PRESS BENDING

George Richard Claassen, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 22, 1977, Ser. No. 808,762
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—273 **5 Claims**



1. An apparatus for press bending glass sheets, comprising:

first and second bending molds having respective first and second opposed complementary shaping surfaces corresponding to the desired shape for the glass sheets;

means for reciprocating the bending molds toward each other so as to press a heat-softened glass sheet vertically hung from tongs between the shaping surfaces into a shape in which a lower end of at least one set of tongs is tilted from its vertically hanging position toward the first shaping surface;

a first notch in the upper edge of the first shaping surface and a second notch in the upper edge of the second shaping surface, said notches being aligned with each other so as to receive a lower end portion of said tilting tong set when the shaping surfaces engage a glass sheet; and

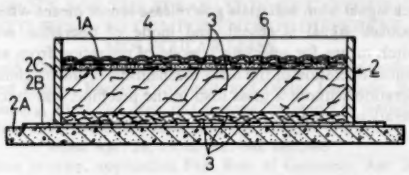
tong stop means including a tong contacting surface behind the second shaping surface horizontally aligned with and facing the second notch, and means for rigidly mounting the tong contacting surface onto the second bending mold at a distance behind the second notch sufficient to come into non-yielding contact with a lower end portion of said tilting tong set as the portions of the shaping surface around the second notch come into engagement with a glass sheet and to limit the degree to which the tilting tong set may return toward its freely hanging vertical position.

4,108,625

METHOD OF, AND APPARATUS FOR PRODUCING FERTILIZER BY UTILIZING EARTHWORMS

Tokio Okada, Yokkaichi, Japan, assignor to Okada Seimen Yugen Kaisha, Yokkaichi, Japan

Filed Nov. 24, 1976, Ser. No. 744,772
Claims priority, application Japan, Nov. 26, 1975, 50-141878
Int. Cl.[2] C05F *11/08*
U.S. Cl. 71—9 **9 Claims**



1. A method of producing a natural fertilizer, comprising:
forming a layer of fermented vegetable matter which is maintained in a moistened condition;
breeding earthworms in said layer, in which said earthworms eat said vegetable matter and discharge feces on said layer;
gathering said feces; and
refining said feces, whereby said fertilizer is obtained.

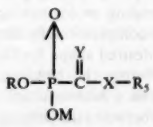
4,108,626

ALKOXYCARBONYLPHOSPHONIC ACID DERIVATIVE BRUSH CONTROL AGENTS

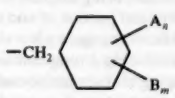
Colin Leslie McIntosh, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 616,837, Sep. 25, 1975, Pat. No. 4,033,749, and a continuation-in-part of Ser. No. 474,536, May 30, 1974, Pat. No. 3,943,201, which is a continuation-in-part of Ser. No. 397,723, Sep. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 381,620, Jul. 23, 1973, abandoned. This application Mar. 17, 1977, Ser. No. 778,790
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.[2] A01N *9/36*
U.S. Cl. 71—76 **5 Claims**

1. A method of retarding plant growth in woody plants consisting essentially of applying to the plant an effective amount of



wherein
R is M; alkyl of 1 to 8 carbon atoms, optionally substituted with a chlorine, bromine, fluorine, or iodine; alkenyl of 3 to 8 carbon atoms; or



wherein
A is chlorine or methyl,
B is chlorine or methyl,
n is 0 or 1, and
m is 0 or 1;
R_5 is alkyl of 1 - 6 carbon atoms, alkenyl of 3 to 4 carbon atoms, or benzyl;
X is oxygen or sulfur; and
Y is oxygen or sulfur, provided that when Y is sulfur, X is sulfur; and when X is sulfur, R is not hydrogen; and at least one of X and Y is sulfur;
M is hydrogen, sodium, lithium, potassium, calcium, magnesium, zinc, manganese, barium, or

wherein
R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms;
R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms;
R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms; and
R_4 is hydrogen or alkyl of 1 to 12 carbon atoms,
provided that the total number of carbon atoms in R_1, R_2, R_3, and R_4 is less than 16.

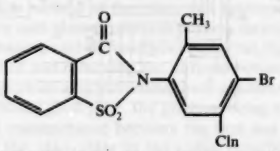
4,108,627

N-(SUBSTITUTED PHENYL) DERIVATIVES OF SACCHARIN

Frederic G. Bollinger, and John J. D'Amico, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

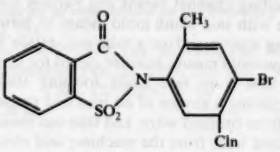
Division of Ser. No. 537,989, Jan. 2, 1975, Pat. No. 4,006,007. This application Oct. 7, 1976, Ser. No. 730,505
Int. Cl.[2] A01N *5/00*; C07D *275/06*
U.S. Cl. 71—91 **7 Claims**

1. A compound having the formula



wherein *n* is 0 or 1.

3. A method of regulating the growth of leguminous plants which comprises treating said plants with a plant growth regulating effective amount of a compound of the formula



wherein *n* is 0 or 1.

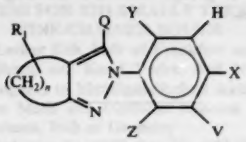
4,108,628

CYCLOALKANOPYRAZOLE HERBICIDES MIXTURES

Anthony David Wolf, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 717,014, Aug. 26, 1976, Pat. No. 4,059,434, which is a continuation-in-part of Ser. No. 640,348, Dec. 12, 1975, abandoned, and a continuation-in-part of Ser. No. 622,763, Oct. 15, 1975, abandoned. This application Oct. 12, 1977, Ser. No. 841,452
Int. Cl.[2] A01N *9/02*
U.S. Cl. 71—92 **21 Claims**

1. A mixture consisting essentially of (1) a compound of the formula



where

n is 3, 4 or 5;

R_1 is hydrogen or methyl;

Q is fluorine, chlorine, bromine or iodine;

X is fluroine, chlorine, bromine, iodine, cyano, methoxy or nitro;

Y is hydrogen, fluorine or chlorine;

Z is hydrogen or fluorine; and

V is hydrogen, fluorine, chlorine or methoxy;

with the proviso that

(a) when n is 5, R_1 must be hydrogen, Q must be chlorine or bromine, Z and V must both be hydrogen and Y must be hydrogen or fluorine;

(b) when n is 3 or 4 and Q is fluorine or iodine, R_1, Z and V must be hydrogen and Y must be hydrogen or fluorine;

(c) when n is 3 and R_1 is methyl, Q must be chlorine or bromine, Y must be hydrogen or fluorine and Z and V must be hydrogen; and

(d) when V is other than hydrogen, X must be fluorine, chlorine or bromine and Z must be hydrogen and (2) a compound selected from the group consisting of 2-tert-butyl-4-(2,4-dichloro-5-isopropyloxophenyl)1,3,4-oxadiazolin-5-one, 2,4-dichlorophenyl-4'-nitrophenyl ether, 2,4,6-trichlorophenyl 4-nitrophenyl ether, S-(2,3,3-trichloroallyl)diisopropythio-carbamate, and Methyl 2-[4-(2,4-dichlorophenoxy(phenoxy))]-propanoate.

4,108,629
HERBICIDAL USE OF ESTERS OF AMINOHALOPYRIDYLOXY ACIDS

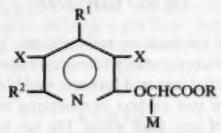
Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 342,782, Mar. 19, 1973, abandoned, which is a division of Ser. No. 166,308, Jul. 26, 1971, Pat. No. 3,755,339. This application Dec. 1, 1976, Ser. No. 745,714

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—94 **8 Claims**

1. A method for controlling the growth of undesirable plant species which comprises applying to plants, plant parts of their habitats a herbicidally effective amount of a compound corresponding to the formula



wherein X represents chloro or bromo; R represents alkyl of 1 to 12 carbon atoms or a radical having the formula $-(CH_2)_nOR^3$ wherein n represents an integer of from 2 to 4 and R_3 represents lower alkyl of 1 to 4 carbon atoms or phenyl; M represents hydrogen or methyl; R^1 represents hydrogen, loweralkyl of 1 to 4 carbon atoms, amino or loweralkylamino of 1 to 4 carbon atoms; and R^2 represents hydrogen, X, loweralkyl, amino or loweralkylamino, with the proviso that one of R^1 or R^2 is always amino or loweralkylamino and the other of R^1 and R^2 is always other than amino or loweralkylamino.

4,108,630
1-ALKYLPYRID-2-ONES

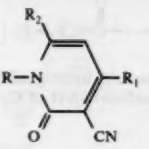
Wayne O. Johnson, Warminster; Michael C. Seidel, Chalfont, and Harlow L. Warner, Hatboro, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 513,987, Oct. 11, 1974, Pat. No. 4,038,065. This application Mar. 25, 1977, Ser. No. 781,254

Int. Cl.[2] A01N *9/22*; **C07D** *213/57*

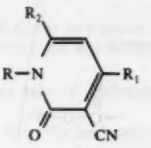
U.S. Cl. 71—94 **7 Claims**

1. A compound of the formula



wherein R is $(C_1–C_{12})$ alkyl, R_1 is methyl or ethyl, R_2 is hydrogen, methyl or ethyl and the physiologically acceptable salts thereof.

4. A method for producing plant growth regulatory activity which comprises applying a plant growth regulatory amount of a compound of the formula



wherein R is $(C_1–C_{12})$ alkyl, R_1 and R_2 are hydrogen, methyl or ethyl and the physiologically acceptable salts thereof to a plant, to plant seeds, or to the habitat of a plant.

4,108,631
RING-SUBSTITUTED N-(2,2-DIFLUOROALKANOYL)-O-PHENYLENEDIAMINE COMPOUNDS

George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

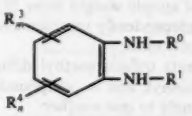
Division of Ser. No. 590,226, Jun. 25, 1976, Pat. No. 4,011,341, which is a division of Ser. No. 479,073, Jun. 13, 1974, Pat. No. 3,907,892, which is a continuation-in-part of Ser. No. 277,452, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,857, Jun. 19, 1970, abandoned, and Ser. No. 17,865, Mar. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 803,998, Mar. 3, 1969, abandoned. This application Dec. 6, 1976, Ser. No. 747,763

Int. Cl.[2] A01N *9/14, 9/20, 9/28*

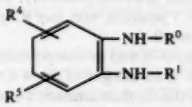
U.S. Cl. 71—103 **13 Claims**

1. The method which comprises applying to a plant part a growth-inhibiting amount of an active agent, said active agent being a compound selected from the group consisting of the compounds of the formulae:

I.



II.



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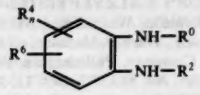
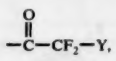
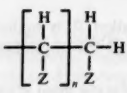
III. 

wherein

R^0 represents a 2,2-difluoroalkanoyl radical of the formula



wherein Y represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C_1–C_6, or radical of the formula

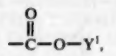


wherein each Z independently represents hydrogen or halogen and n represents 0 or 1;

R^1 represents

hydrogen,

radical of the formula



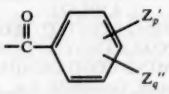
wherein Y^1 represents loweralkyl of C_1–C_4 or phenyl,

benzoyl,

furoyl,

naphthoyl, or

substituted benzoyl of the formula



wherein each Z′ independently represents halo or nitro, Z″ represents loweralkyl of C_1–C_4 or loweralkoxy of C_1–C_4, p represents 0, 1, or 2, q represents 0 or 1, and the sum of p and q is 1–3;

R^2 represents

R^0,

R^1,

alkanoyl of C_1–C_8,

loweralkenoyl of C_3–C_4,

loweralkynoyl of C_3–C_4,

halogenated loweralkanoyl of C_2–C_4 bearing on any position or positions one or more halogen atoms, each independently selected, subject to the limitation that the alpha position bear at least one substituent moiety selected from the group consisting of hydrogen and halogen of atomic weight from 35 to 127, both inclusive;

each R^3 independently represents halogen;

R^4 represents nitro;

R^5 represents trifluoromethyl difluoromethyl, or difluorochloromethyl, and in compounds of Formula II, R^4 and R^5 are meta to one another;

R^6 represents loweralkylsulfonyl of C_1–C_4 and is located at the 4 or 5 position, and any R^4 group is meta to R^6;

m represents 0–4;

n represents 0–1; and in compounds of Formula I, the sum of m and n is an integer of from 1 to 4;

subject to the further limitation that where R^1 or R^2 represents hydrogen, the ring position ortho to the —NH—R^1 or —NH—R^2 group bears one of the designated R^3, R^4, or R^5 moieties.

4,108,632

USE OF PHTHALANILIC ACIDS TO REGULATE THE GROWTH OF CORN PLANTS

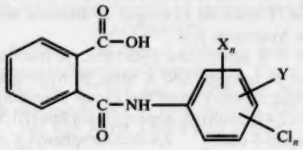
Frederic G. Bollinger; John J. D'Amico, both of St. Louis, and Dale J. Hansen, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1976, Ser. No. 753,392

Int. Cl.[2] A01N *9/20, 9/14*

U.S. Cl. 71—115 **6 Claims**

1. A method for altering the development of the reproductive components of a corn plant which comprises applying to said corn plant before or during the early stages of reproductive differentiation an effective, non-lethal amount of a compound having the formula



wherein X is halogen, CF_3 or lower alkoxy; Y is halogen, CF_3, lower alkoxy, phenoxy, SCH_3, hydroxyethyl, or lower alkyl; each n is independently 0 or 1; and agriculturally acceptable salts thereof provided that Y cannot be fluorine in the 3 position, when n is 0.

4,108,633

ARC FURNACE STEELMAKING

David Engledow, Rotherham, England, assignor to British Steel Corporation, Great Britain

Filed Jun. 8, 1977, Ser. No. 804,744

Claims priority, application United Kingdom, Jun. 14, 1976, 24557/76

Int. Cl.[2] C21C *5/52*

U.S. Cl. 75—11 **13 Claims**

1. A method of steelmaking in an electric arc furnace comprising the step of continuously charging a blend of particulate iron-bearing material into said furnace, said blend comprising a first particulate of low carbon iron-bearing material having a carbon content of les than about 1% (as herein defined) a second particulate of high carbon iron-bearing material having a carbon content greater than said first particulate and less than about 4% and a third particulate different from the first and second particulates comprising fragmented steel scrap, the relative proportions of the particulates in the blend and the rate of charging of said blend in said furnace being controlled to:

(a) maximise the utilisation of both the electrical energy supplied to said furnace and the chemical energy generated within said furnace by the charged materials; and

(b) secure the desired carbon content of the steel on tapping said furnace.

4,108,634
PROCESS FOR THERMALLY TREATING FINE-GRAINED SOLIDS

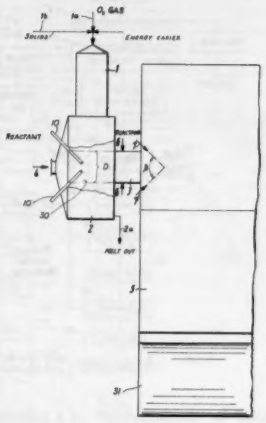
Martin Rahn; Lothar Reh, both of Frankfurt am Main; Bernd Thöne, Friedberg, and Karel Vydra, Bad Nauheim, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Deutsche Babcock Aktiengesellschaft, Oberhausen, both of Germany

Filed Aug. 11, 1977, Ser. No. 823,858

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 2716083

Int. Cl.[2] C21B *15/00*

U.S. Cl. 75—23 **17 Claims**



1. A process for thermally treating particulate solids with a high-oxygen gas comprising the steps of:

(a) mixing said particulate solids with said gas to form a first suspension;

(b) introducing said first suspension to a vertical elongated combustion path at a velocity sufficient to prevent backfiring and reacting said first suspension to form a second suspension, in which the suspended phase consists predominantly of molten particulates;

(c) introducing said second suspension into a cyclone chamber and further separating the components of said second suspension in said cyclone chamber to form a melt and an exhaust gas, said cyclone chamber having an axial outlet in an end wall thereof whereby a core-flow region of gas is formed in said cyclone chamber;

(d) withdrawing said melt from said cyclone chamber through an opening in the lower portion of the shell;

(e) passing said exhaust gas from said outlet over a gas-transfer region immediately into a succeeding cooling chamber, said core-flow region, said gas-transfer region and said feed region defining a gas flow path;

(f) introducing a reactant into said core-flow region or into said exhaust gas immediately downstream thereof.

4,108,635
SOLDER SKIMMINGS RECOVERY PROCESS

James E. Reynolds, Golden, Colo., assignor to Hazen Research Inc., Golden, Colo.

Filed Mar. 26, 1976, Ser. No. 670,695

Int. Cl.[2] C22B *13/00, 13/04;* **C01C** *1/16;* **C01G** *9/04*

U.S. Cl. 75—24 **6 Claims**

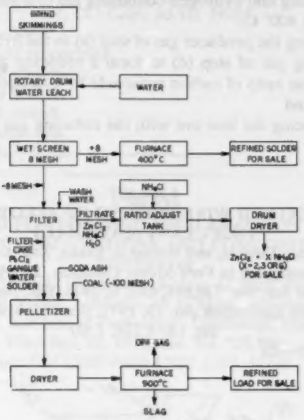
1. A method for recovering solder, zinc chloride and ammonium chloride, and lead from solidified solder skimmings, comprising the following steps:

(a) grinding the skimming to a small size;

(b) water leaching the solder skimmings with violent agitation to both mechanically separate and dissolve both zinc chloride and ammonium chloride thereby freeing occluded pieces of solder and particles of lead chloride;

(c) separating the pieces of solder from the leach slurry;

(d) refining the reclaimed solder by heat to purify it;



(e) filtering the leach slurry to separate ammonium chloride and zinc chloride solution and water from the lead chloride;

(f) recovering a filter cake of predominantly lead chloride; and

(g) recovering lead from the lead chloride.

4,108,636
METHOD OF THE DIRECT REDUCTION OF IRON ORE

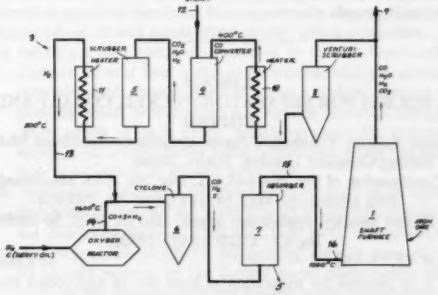
Georg Lange, Voerde, Germany, assignor to Thyssen Purofer GmbH, Dusseldorf, Germany

Continuation-in-part of Ser. No. 722,062, Sep. 9, 1976, and Ser. No. 603,196, Aug. 8, 1975, Pat. No. 4,046,555, said Ser. No. 722,062, is a division of Ser. No. 603,196,. This application Sep. 1, 1977, Ser. No. 829,937

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1974, 2438790

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—35 **6 Claims**



1. In the reduction of iron ore wherein the ore is subjected to a reducing gas and a stack gas is produced, the improvement comprising the steps of:

(a) reacting oil and oxygen to make a producer gas of carbon monoxide and hydrogen in a volume ratio of at least about 1:1 and at a temperature above about 1300° C;

(b) treating said stack gas with steam to convert said stack

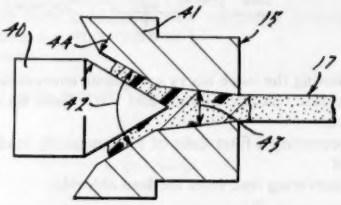
gas into a converter-gas mixture of carbon dioxide and hydrogen;
(c) scrubbing said carbon dioxide out of the converter-gas mixture of step (b) to form a hydrogen-containing gas;
(d) heating said hydrogen-containing gas to a temperature of about 400° C;
(e) adding the producer gas of step (a) to the hydrogen-containing gas of step (d) to form a reducing gas having a volume ratio of carbon monoxide to hydrogen of at most 1:1; and
(f) reducing the iron ore with the reducing gas of step (e).

4,108,637

SHEATHED WIRE FEEDING OF ALLOY AND INOCULANT MATERIALS

Adolf Hetke, Livonia, and Walter J. Evans, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 730,095, Oct. 6, 1976, Pat. No. 4,088,477. This application Jul. 25, 1977, Ser. No. 819,017
Int. Cl.[2] C21C *7/00*
U.S. Cl. 75—53 **4 Claims**



1. An injectable strand useful in producing metallurgical changes in molten metal, comprising:
(a) an elongate strand consisting essentially of a uniform mixture of at least one particulate reaction agent suspended in a solid matrix consisting of a flexible binder vaporizable upon contact with said molten metal, said binder constituting 10–20% by volume of the strand and the remainder being said particulate reaction agent, said strand having the particles of said agent arranged substantially uniformly along the length of said strans as well as transversely thereof to establish substantially uniformity of weight distribution throughout the strand, certain particles of said reaction agent being exposed to the exterior of said strand.

4,108,638

PROCESS FOR SEPARATING NICKEL, COBALT AND COPPER

Sanai Nakabe, Yokohama, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Continuation of Ser. No. 645,422, Dec. 30, 1975, abandoned. This application May 24, 1977, Ser. No. 799,924
Claims priority, application Japan, Jan. 23, 1975, 50-10059
Int. Cl.[2] C22B *15/00, 23/02*
U.S. Cl. 75—63 **33 Claims**

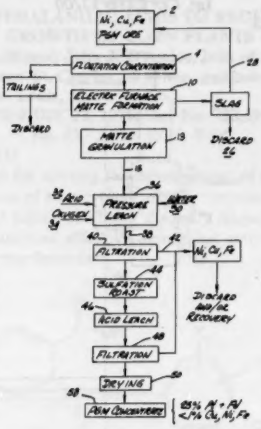
1. A process for separating at least one of and cobalt from copper comprising the steps of providing a molten mixture containing copper and at least one member selected from the group consisting of nickel and cobalt, metallic iron and carbon, at least some of the mixture being in the form of a matte, and allowing the mixture to form a high carbon ferrous alloy having a carbon content of at least 0.5% and a matte in two separate phases, thereby extracting the major part of said member in the formed high carbon ferrous alloy and the major part of the copper in the formed matte.

4,108,639

PROCESS FOR RECOVERING PLATINUM GROUP METALS FROM ORES ALSO CONTAINING NICKEL, COPPER AND IRON

Malcolm John Lake, Pickering, and William Richard Noble Snelgrove, Oakville, both of Canada, assignors to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 703,995, Jul. 9, 1976, abandoned. This application May 4, 1977, Ser. No. 793,903
Int. Cl.[2] C22B *11/04*
U.S. Cl. 75—101 R **27 Claims**



1. A process for the separation of a platinum group metal concentrate from an ore containing iron, nickel and copper in addition to said platinum group metals, which process comprises:
(a) concentrating said ore by flotation to form a concentrate;
(b) subjecting said ore concentrate to electric furnace melting to form a low grade matte;
(c) granulating said matte to form granules;
(d) leaching metals from said granules in the presence of sulfuric acid, oxygen and water;
(e) filtering the leached metals to obtain a filtrate predominately containing dissolved salts of said iron, nickel and copper and a filter cake predominately containing said platinum group metals;
(f) sulfation roasting said filter cake;
(g) acid leaching coper, nickel and iron metals from the roasted filter cake; and
(h) filtering and recovering a solid platinum group metal concentrate from said roasted and leached filter cake.

4,108,640

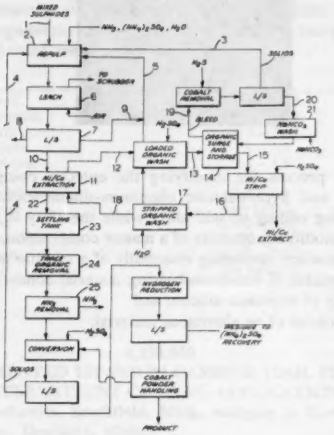
HYDROMETALLURGICAL PROCESS FOR THE PRODUCTION OF COBALT POWDER FROM MIXED METAL SULPHIDES

Herbert F. Wallace, Sherwood Park, and Donald R. Weir, Fort Saskatchewan, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Aug. 11, 1976, Ser. No. 713,325
Claims priority, application Canada, Aug. 25, 1975, 234319
Int. Cl.[2] C22B *23/04*
U.S. Cl. 75—103 **9 Claims**

1. A process for recovering metallic cobalt from mixed sulphide materials containing sulphides of cobalt and of at least one metal selected from the group consisting of nickel and copper, said process comprising leaching said mixed sulphide materials with an aqueous ammoniacal solution in the presence of oxygen to dissolve cobalt and said at least one metal as ammine sulphates and convert substantially all dissolved cobalt values to the cobaltic form, separating the resulting cobalt and

said at least one metal bearing leach solution from undissolved residue and contacting said separated leach solution with a water immiscible liquid organic ion exchange reagent dissolved in an inert organic diluent to selectively substantially completely extract said at least one metal from said leach solution and produce an aqueous cobalt bearing raffinate substantially free of said at least one metal and an organic extractant phase loaded with said at least one metal, washing said loaded organic extractant phase to remove substantially all ammonia therefrom, contacting said loaded and washed organic extractant phase acid solution to strip said at least one metal therefrom, separating the resulting said at least one metal bearing aqueous acid solution from the resulting stripped or-



ganic extractant phase, washing said stripped organic extractant with a wash liquid to remove values of said at least one metal therefrom, using said wash liquid after said washing of said stripped organic extractant to effect said washing of said loaded organic extractant, recycling said stripped and washed organic extractant to treat additional leach solution for extraction of said at least one metal therefrom, treating said cobalt bearing raffinate to reduce substantially all cobaltic cobalt values to cobaltous form, and reacting the resultant cobaltous cobalt bearing solution with hydrogen at elevated temperature and pressure to precipitate dissolved cobalt in metallic powder form and recovering said cobalt powder from the reduced end solution.

4,108,641

OXIDATION-RESISTING AUSTENITIC STAINLESS STEEL

Tokio Fujioka; Masayuki Kinugasa; Shozo Iizumi; Shizuhiro Teshima, and Isamu Shimizu, all of Shin-Nanyo, Japan, assignors to Nisshin Steel Company, Limited, Japan

Division of Ser. No. 679,601, Apr. 23, 1977, Pat. No. 4,063,935, which is a continuation-in-part of Ser. No. 529,766, Dec. 4, 1974, abandoned. This application Jul. 11, 1977, Ser. No. 814,808

Claims priority, application Japan, Dec. 22, 1973, 48-142976; Dec. 22, 1973, 48-142977

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.[2] C22C *38/06, 38/42, 38/48, 38/50*

U.S. Cl. 75—124 **17 Claims**

1. An oxidation-resisting austenitic stainless steel consisting essentially of not more than 0.15% by weight of C, 2.56 – 4.0% by weight of Si, not more than 2.0% by weight of Mn, 8 – 22% by weight of Ni, 16 – 25% by weight of Cr, 0.001 – 0.05% by weight of at least one alkaline earth metal, 0.001 – 0.1% by weight of at least one rare earth metal and the balance Fe.

4,108,642

ALLOY FOR PREPARING DENTURES THEREFROM

Vincent T. Chiaramonte, Baldwin, N.Y., assignor to Apex Dental Lab. Inc., New York, N.Y.

Filed May 11, 1977, Ser. No. 795,954

Int. Cl.[2] C22C *30/00, 19/05*

U.S. Cl. 75—134 F **3 Claims**

1. The alloy comprising:
15 to 30% chromium,
30 to 60% nickel,
15 to 30% cobalt,
1 to 5% iron, and
1 to 2% beryllium.

4,108,643

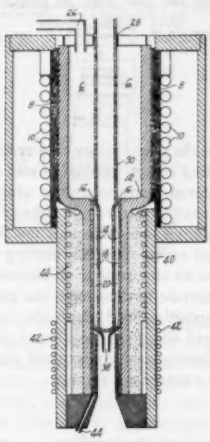
METHOD FOR FORMING HIGH FRACTION SOLID METAL COMPOSITIONS AND COMPOSITION THEREFOR

Merton C. Flemings, Cambridge; Rodney G. Riek, Reading, and Kenneth P. Young, Arlington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 22, 1976, Ser. No. 725,903

Int. Cl.[2] C22B *4/00;* **C22C** *1/02, 33/00*

U.S. Cl. 75—135 **37 Claims**



1. The method for forming a metal composition having solid discrete degenerate dendrites homogeneously dispersed within a liquid phase of said metal composition which comprises:

a. heating a first metal composition to form a liquid-solid mixture of said first metal composition wherein greater than about 65 weight percent up to a weight percent of primary solids where there is sufficient fusion of the primary solids to each other which prevents the primary solids from sliding along their boundaries when the mixture is subjected to shear forces, and

b. vigorously agitating said liquid-solid mixture in an agitation zone to convert the solid therein to discrete degenerate dendrites derived from said first metal composition, said degenerate dendrites comprising greater than about 65 weight percent of the heated metal composition and wherein the remainder of the heated metal composition is liquid wherein the surface in said agitation zone contacting said liquid-solid mixture is stable against degradation by said liquid-solid mixture and is not wet by said liquid-solid mixture, and

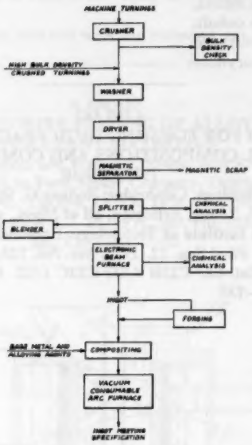
c. continuously monitoring the apparent viscosity or an analog of the apparent viscosity of the liquid-solid mixture thereby to control the heat extracted from said mixture to maintain the primary solids content of said mixture above about 65 weight percent.

4,108,644

MANUFACTURE OF REACTIVE METALS AND ALLOYS

M. Victor Walberg, Incline Village, Nev., and James H. C. Lowe, Moraga, Calif., assignors to Viking Metallurgical Corp., Verdi, Nev.

Filed Nov. 11, 1976, Ser. No. 740,788
Int. Cl.[2] C22C *15/00*
U.S. Cl. 75—135 6 Claims



1. A method for the manufacture of a reactive metal alloy, comprising collecting revert material of said alloy, a majority of said revert material being machined chips, crushing said revert material, controlling the bulk density of said crushed revert material to above 30 pounds per cubic foot, washing and drying said crushed revert material, melting and casting said revert material into an electrode in an electron beam furnace, analyzing said electrode to determine the chemical composition thereof, compositing said electrode with quantities of prime base metal and alloying agents based upon said analysis, and melting and casting said composited electrode in a consumable electrode vacuum arc furnace.

4,108,645

PREPARATION OF RARE EARTH AND OTHER METAL ALLOYS CONTAINING ALUMINUM AND SILICON

Alec Mitchell, West Vancouver, Canada; James R. Goldsmith, Pittsburgh, Pa., and J. Malcolm Gray, Stamford, Conn., assignors to Molycorp, Inc., White Plains, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,867
Int. Cl.[2] C22C *21/04*
U.S. Cl. 75—135 32 Claims

1. A method for making alloys of aluminum and silicon with a third metal selected from the group consisting of rare earth metals and a metal from Groups 4b, 5b and 6b of the Periodic Table which comprises reducing the oxides of the metals with aluminum in the presence of silicon in a flux system comprising an alkali metal or alkaline earth metal fluoride, an alkaline earth metal oxide, and Al_2O_3 maintained liquid at a temperature between about 1250° C – 1600° C while maintaining the flux basic to suppress the activity of the Al_2O_3 present.

4,108,646

STRONTIUM-BEARING MASTER COMPOSITION FOR ADDITION TO EUTECTIC AND HYPO-EUTECTIC SILICON-ALUMINUM CASTING ALLOYS

Richard J. Gennone, Neptune City, N.J., and Robert D. Sturdevant, East Greenville, Pa., assignors to Kawecki Berylco Industries, Inc., Reading, Pa.

Continuation-in-part of Ser. No. 585,811, Jun. 11, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,553
Int. Cl.[2] C22C *1/03*
U.S. Cl. 75—148 24 Claims

16. A process for modifying the eutectic component of eutectic and hypo-eutectic aluminum-silicon casting alloys comprising adding to said alloy while the alloy is in molten form, a modifying quantity of a master composition, said master composition consisting essentially of a mixture of:

(a) particles of strontium-bearing material consisting essentially of strontium-silicon; and

(b) particles of an aluminous material.

4,108,647

ALLOYS OF NICKEL, CHROMIUM AND COBALT

Stuart Walter Ker Shaw, Sutton Coldfield, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jul. 8, 1976, Ser. No. 703,563
Claims priority, application United Kingdom, Jul. 17, 1975, 30043/75
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 8 Claims

1. In combination with a nickel-base alloy adapted for use at elevated temperature consisting essentially of, by weight, about 20% to 25% chromium, about 5% to 25% cobalt, up to 3.5% molybdenum, up to 5% tungsten, the tungsten and molybdenum being correlated such that the %W + 0.5(%Mo) is from 0.5% to 5%, about 1.7% to 5% titanium and about 1% to 4% aluminum, the sum of the titanium and aluminum being about 4% to 6.5% with the ratio therebetween being from 0.75:1 to 4:1, from 0.02% to 0.25% carbon, from 0.5% to 3% tantalum, up to 3% niobium, 0.005% to 1% zirconium and up to 2% hafnium, the value of % Zr + 0.5(%Hf) being from 0.01% to 1%, about 0.001% to 0.05% boron, up to about 0.2% in total of yttrium and/or lanthanum, and balance essentially nickel in an amount at least 30%, the improvement comprising a chromium content of more than 22% and carbon and boron contents in ranges of 0.001% to 0.25% carbon and 0.05% to 1% boron provided that when the carbon content is in the range of from 0.02% to 0.25%, the boron content is greater than 0.05% up to 1%.

4,108,648

NICKEL-BASED ALLOY

Galina Vasilievna Zhurkina; Galina Evseevna Moskalenko, both of 2 Frunzenskaya ulitsa, 10, kv. 81; Fedor Fedorovich Khimushin, B. Dorogomilovskaya ulitsa, 29, kv. 26; Nikolai Fedorovich Lashko, Kosinsky pereulok, 18, korpus 3, kv. 272; Klavdia Pavlovna Sorokina, Kosinsky pereulok, 20, korpus 1, kv. 62, all of Moscow; Tamara Mikhailovna Grebtsova, ulitsa Gorkogo, 15, kv. 5, Elektrostal Moskovskoi oblasti, and Evgenia Markovna Kontsevaya, Kotelnicheskaya naberezhnaya, 1/5, korpus A, kv. 15, Moscow, all of U.S.S.R.

Filed Sep. 20, 1976, Ser. No. 724,469
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 4 Claims

1. A nickel-based alloy consisting of carbon, chromium, cobalt, titanium, aluminum, tungsten, molybdenum, yttrium, boron, magnesium, and cerium, said components being present in the following weight %:

carbon	0.05 - 0.10
chromium	15.0 - 18.0
cobalt	10.0 - 17.0
titanium	1.8 - 2.5
aluminum	2.8 - 3.5
tungsten	2.5 - 5.0
molybdenum	6.0 - 7.5
yttrium	up to 0.2
boron	0.005 - 0.02
magnesium	0.005 - 0.05
cerium	0.005 - 0.02
nickel	the balance.

4,108,649

CEMENTED TITANIUM CARBIDE TOOL FOR INTERMITTENT CUTTING APPLICATION

David Moskowitz, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 634,972, Nov. 24, 1975, Pat. No. 4,019,874. This application Oct. 6, 1976, Ser. No. 730,098
Int. Cl.[2] B22F *3/00, 1/00*
U.S. Cl. 75—203 1 Claim

1. A method of making a sintered compact useful as a cutting tool and having improved nose push resistance and increased grain refinement, the method comprising:

(a) blending together a titanium carbide powder, nickel-coated aluminum powder, at least one of molybdenum powder and molybdenum carbide powder, an additive powder having vanadium carbide and titanium nitride,

(b) milling said powders in the presence of a waxy lubricant, cemented carbide media, and acetone for a sufficient time to achieve thorough homogeneity and blending,

(c) drying said blended powders and screening to −20 mesh,

(d) compacting said screened blended powders under a force between 16,000 and 24,000 psi and heating to dewax said compact under a dry hydrogen atmosphere, and

(e) preparing closed graphite trays and inserting said compacted powders thereinto while evacuating the furnace and holding trays to less than one micron mercury, sintering said compact and said close graphite trays at a temperature of about 1400° C for a period of about 1 hour.

4,108,650

PROCESS FOR THE PREPARATION OF MOLYBDENUM BASED ALLOYS WITH SOLID REINFORCING ELEMENTS BY SINTERING

Géraud Fustier, Bonneville; Jean-Paul Langeron, Chatenay Malabry; Joseph de la Bastie, and Jean Carlizza, both of Le Fayet, all of France, assignors to Cime Bocuze, Paris, France

Filed Apr. 23, 1976, Ser. No. 679,823
Claims priority, application France, Apr. 23, 1975, 75 13489
Int. Cl.[2] B22F *3/14*
U.S. Cl. 75—206 4 Claims

1. A process for the preparation of molybdenum based alloys containing titanium and zirconium, or titanium and thorium, as reinforcing elements, comprising,

(a) introducing into molybdenum used in the form of ammonium decamolybdate, zirconium oxide and titanium oxide or thorium nitrate and titanium oxide, as addition compounds, all in the solid state,

(b) mixing the ammonium decamolybdate and addition compounds to obtain an intimate mixture,

(c) reducing the ammonium decamolybdate in the mixture to metallic molybdenum, by hydrogen at about 500° C,

(d) adding and mixing carbon in sufficient quantity to at least partially reduce the addition compounds to the metallic state,

(e) compressing the (d) mixture at a pressure of about 1000 bars to form briquettes, and

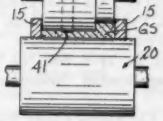
(f) sintering the briquettes at a temperature at which the said carbon completes the reduction of the titanium oxide and solution thereof in the molybdenum, while the zirconium oxide or thorium oxide appears as a dispersed phase.

4,108,651

METHOD OF PRODUCING A MULTI-GAGE STRIP OR SHAPE FROM POWDERED METAL

Claude D. Tapley, 77 Woodland Dr., Cheshire, Conn. 06410

Filed May 24, 1976, Ser. No. 689,675
Int. Cl.[2] B22F *3/18*
U.S. Cl. 75—208 CS 5 Claims



1. The method of producing a continuous multigage roll-formed strip or shape from powdered metal in a generally rectangular cross-sectional configuration comprising

(a) roll compacting a suitable powdered metal between a set of opposed rolls, one of said rolls having an asymmetrically stepped diameter, to an intermediate configuration having at least one uniformly thicker portion and at least one uniformly thinner portion, said thinner portion having no thickness as great as that in the thicker portion;

(b) sintering said compacted powdered metal multigage strip at a temperature and time suitable for the powdered metal alloy involved; and

(c) further rolling both thicker and thinner portions of the sintered strip with rolls proportioned to effect substantially equal percent reductions in both thicker and thinner portions.

4,108,652

METHOD FOR PRODUCING A SINTERED BODY OF HIGH DENSITY

Kazuki Ogawa, Fukuoka; Mitsue Koizumi, Toyonaka; Mitsuhiko Furukawa, Fukuoka; Yoshimichi Hara, Fukuoka, and Takashi Kitahira, Fukuoka, all of Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

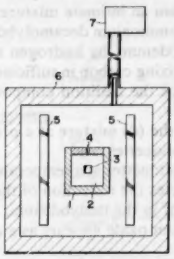
Filed Aug. 17, 1976, Ser. No. 715,082
Int. Cl.[2] B22F *1/04, 3/14*
U.S. Cl. 75—223 30 Claims

1. A method for producing a sintered body of high density comprising the following steps:

first step: packing a mixed body of a metal powder, a chloride salt and crushed refractory material into a mold which previously contains the pre-sintered body such that

said mixed body covers the entire surface of said pre-sintered body, heating said mold until pure metal having a thickness of more than 8 micron is extracted over the surface of said pre-sintered body so that said extracted metal forms a capsule coating of said metal on said body;

second step: disposing said capsule-coated body obtained



from the first step into a heating furnace and filling said heating furnace with a fluid pressure medium such as a nitrogen gas or an inert gas; and

third step: keeping the atmosphere within said furnace at a desired temperature and a desired pressure so as to compress said pre-sintered body at a high temperature by way of said metal-capsule.

4,108,653

PRESSURE-FIXABLE TONER POWDER WITH A THERMOPLASTIC POLYETHYLENE BINDER

Martinus T. J. Peters, Venlo, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Oct. 26, 1976, Ser. No. 735,821

Claims priority, application Netherlands, Jul. 5, 1976, 7607380

Int. Cl.[2] G03G *13/20, 9/00*

U.S. Cl. 96—1 SD **11 Claims**

1. Pressure-fixable toner powder comprising particles which consist essentially of thermoplastic binder having dispersed therein colorant and, optionally, additives, characterized in that said binder comprises predominantly, in an amount rendering said particles readily fixable to a receiving surface by pressure, a polyethylene having a weight average molecular weight of at least 1,500, a crystallinity of at least 75% and a density of at least 0.93.

4,108,654

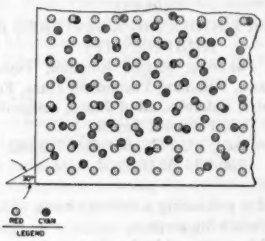
COLOR ELECTROPHOTOGRAPHIC PROCESS EMPLOYING A DOCUMENT SCREEN

Robert N. Goren, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 6, 1974, Ser. No. 467,326

Int. Cl.[2] G03G *15/01, 13/01;* **G03F** *5/00*

U.S. Cl. 96—1.2 **14 Claims**



1. In a color electrophotographic imaging process comprising one or more sequences wherein an original document is provided at an exposure station, illuminated, and light reflected from said illuminated original document is passed through a color filter and lens system and directed onto a charged photosensitive member sufficient to form a latent electrostatic image thereon, the improvement comprising conducting said imaging process with a document screen positioned proximate to the image face of said original document between said document and said lens system, said document screen comprising:

a clear transparent substrate material having clear areas and bearing colored areas;

said colored areas comprising at least one repetitive pattern of like dots of one color;

said like dots arranged with respect to other like dots at an average like dot inch frequency such that the optical system employed in the electrophotographic process passes the fundamental spatial frequencies and attenuates the harmonic spatial frequencies.

4,108,655

METHOD OF MAKING A THERMO ACTIVE IMAGING MEMBER

Joseph M. Kropac, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1974, Ser. No. 445,767

Int. Cl.[2] G03G *13/22, 5/04*

U.S. Cl. 96—1.5 R **16 Claims**

1. A method of preparing a thermo-activated imaging member comprising a donor layer, a receiver layer and sandwiched therebetween a thermo-activator layer in contact with an electrically photosensitive imaging layer capable of being rendered structurally fracturable in response to the combined effects of an applied electric field and exposure to electromagnetic radiation to which said imaging layer is sensitive by means of contact with said thermo-activator at a temperature above the melting point of said activator which comprises the step of:

(1) providing said imaging layer coated on said donor layer;

(2) dispersion coating a thermo-activator onto said imaging layer, and;

(3) fusing said activator into a continuous layer over said imaging layer.

4,108,656

PHOTOCONDUCTIVE MEMBER HAVING A CHARGE GENERATING PIGMENT AND 2,4,7-TRINITROTHIOXANTHONE AS CHARGE TRANSPORT MATERIAL

Masafumi Ohta; Mitsuru Hashimoto, and Akio Kozima, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1976, Ser. No. 751,529

Claims priority, application Japan, Dec. 24, 1975, 50-154428

Int. Cl.[2] G03G *5/02*

U.S. Cl. 96—1.5 R **9 Claims**

1. An electrophotographic plate comprising an electrically conductive substrate and a photoconductive layer overlying said electrically conductive substrate, said photoconductive layer consisting essentially of a mixture of from 0.1 to 30 percent by weight of charge generating pigment having a particle size of less than 5μ, from 1 to 60 percent by weight of 2,4,7-trinitrothioxanthone and the balance is binder resin.

4,108,657

MULTI-ACTIVE PHOTOCONDUCTIVE ELEMENT WITH AN AGGREGATE AND INORGANIC PHOTOCONDUCTOR

William Mey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 534,978, Dec. 20, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 641,058

Int. Cl.[2] G03G *5/09, 5/06*

U.S. Cl. 96—1.6 26 Claims

1. A photoconductive insulating element having at least two layers comprising an aggregate photoconductive layer in electrical contact with an inorganic photoconductor-containing layer,

(a) said aggregate photoconductive layer comprising a continuous, electrically insulating polymer phase and dispersed in said continuous phase a discontinuous phase comprising a finely-divided, particulate, co-crystalline complex of (i) at least one polymer having an alkylidene diarylene group in a recurring unit and (ii) at least one pyrylium-type dye salt, the particulate, co-crystalline complex of said discontinuous phase having a size of about 0.01 to about 25 microns, said aggregate photoconductive layer having a maximum radiation absorption at a wavelength at least about 10 nm. different from the wavelength of maximum absorption of said pyrylium-type dye salt solubilized with said alkylidene diarylene group-containing polymer in a homogeneous composition,

(b) said inorganic photoconductor-containing layer comprising an inorganic zinc oxide or selenium-containing photoconductor.

4,108,658

PROCESS FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Gerardus A. J. Koeleman, Velden, and Johannes H. A. op de Laak, Blerick, both of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Continuation of Ser. No. 603,417, Aug. 11, 1975, abandoned, which is a division of Ser. No. 451,254, Mar. 11, 1974, Pat. No. 3,924,567. This application Feb. 10, 1977, Ser. No. 767,593

Int. Cl.[2] G03G *13/08, 13/09*

U.S. Cl. 96—15 D 4 Claims

1. In a copier including a photoconductor movable in a predetermined path of travel, means for holding a working supply of developer material, a replenishing supply of developer material, means for collecting developer material including an elongated hopper longitudinally extending transverse to said predetermined path of travel, said hopper including a base wall having a centrally disposed aperture, and means for mixing developer material, a process for developing an electrostatic latent image on the photoconductor, said process comprising:

a. moving the photoconductor in said predetermined path of travel;

b. upwardly carrying working developer material from said holding means to said moving photoconductor;

c. contacting the moving photoconductor with carried developer material;

d. collecting the carried developer material in said hopper after the contacting step;

e. adding replenishing developer material to said hopper;

f. mixing the developer material in said hopper; and

g. feeding the developer material in said hopper to said centrally disposed aperture for discharge therethrough to said holding means.

4,108,659

METHOD OF ENGRAVING PRINTING PLATES OF FORMS BY MEANS OF ENERGY BEAMS, ESPECIALLY LASER BEAMS

Mamiliano Dini, Island of Elba, Italy, assignor to European Rotogravure Association, Fed. Rep. of Germany

Continuation of Ser. No. 391,256, Aug. 24, 1973, abandoned. This application Jul. 31, 1975, Ser. No. 600,804

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1972, 2241849

Int. Cl.[2] G03C *5/00, 5/04*

U.S. Cl. 96—36.3 12 Claims

1. A method for engraving a printing surface with an energy beam, said method comprising:

preparing a reflective mask having a plurality of elemental areas which are adapted to reflect and to pass varying amounts of energy from said energy beam, the amount of energy passable by any given area being representative of the tone gradation of a corresponding area of an original to be engraved upon said printing surface and subsequently reproduced thereby in a printing process,

said preparing step including the steps of providing a basic mask material which substantially reflects said energy beam and forming a plurality of individual cells of differing reflectivity in said mask, said reflectivity being inversely related to the depths of corresponding cells to be engraved in said printing surface whereby the reflectivity of the cells in any given area of said mask with respect to the energy beam is inversely proportional to the tone gradation of a corresponding area of the original to be engraved into said printing surface, and energy not reflected is substantially passed through the mask,

providing an energy beam of substantially constant energy value, said energy beam having a cross sectional area encompassing a plurality of said elemental areas over the masked printing surface, and

interposing said mask between said printing surface and the source of said energy beam such that said energy beam simultaneously illuminates a plurality of said individual cells, whereby said elemental areas are etched onto said printing surface corresponding to the amount of energy passed through respectively associated elemental areas of said mask.

4,108,660

FABRICATION OF DIFFRACTIVE SUBTRACTIVE FILTER EMBOSSING MASTER

Michael Thomas Gale, Wettswil, and James Kane, Zumikon, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,304

Claims priority, application United Kingdom, Apr. 7, 1976, 14163/76

Int. Cl.[2] G03C *5/00*

U.S. Cl. 96—38.2 6 Claims

1. A method employing a recording blank for fabricating a master to be used in embossing a diffractive subtractive filter, representing certain picture-image information defined by a spatial arrangement of contiguous white-manifesting regions and non-white manifesting regions, into a thermoplastic film, said recording blank comprising a substrate having a given surface thereof formed of at least one set of spaced line ridges defining a diffraction grating of a given profile and depth, said given surface having a photoresist disposed thereon which fills the spaces between adjacent line ridges and provides a substantially smooth exterior surface; said method comprising the steps of:

(a) exposing said photoresist to light manifesting said certain picture-image information;

(b) removing all of said exposed photoresist from solely said white-manifesting regions thereby to reveal entirely the spaced line ridges of only those portions of said surface of said substrate underlying said white-manifesting regions;

(c) leveling solely said revealed portions of said surface of said substrate to obliterate the spaced line ridges of said white-manifesting regions, and

(d) then removing all of the remaining photoresist to now reveal entirely the spaced line ridges underlying the non-white manifesting regions of said exposed photoresist.

4,108,661

LIPPMANN-EMULSIONS AND REVERSAL PROCESSING THEREOF

Willy Joseph Vanassche, Kontich; Herman Adelbert Philippaerts; René Omer Duville, both of Edegem, and Francois Leon Schelfaut, St. Niklaas, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 3, 1976, Ser. No. 747,344

Claims priority, application United Kingdom, Dec. 12, 1975, 51088/75

Int. Cl.[2] G03C *5/50, 1/28*

U.S. Cl. 96—59 **4 Claims**

1. In a method of producing a reversal image of an original wherein a photographic material comprising a support and a silver halide Lippmann-emulsion layer the average silver halide grain-size of which is less than 100 nm, is subjected to the following steps: (a) image-wise exposure; (b) developing said image-wise exposed emulsion layer to form a negative silver image; (c) bleaching said negative silver image in the exposed and developed areas, and (d) thereafter rendering by an overall exposure the remaining undeveloped silver halide developable and developing said remaining silver halide or developing the material again in a developer composition comprising a silver halide reducing agent, the improvement which comprises using an emulsion the silver halide grains of which have been chemically sensitized to fog so that a test portion of the emulsion when coated on a support at a coverage of silver halide corresponding to from about 3 g to about 7 g of silver nitrate per sq.m gives a density between about 0.20 and about 0.70 upon development without any exposure for 6 min at 20° C. in a developer of the composition:

hydroquinone: 16.5 g
potassium bromide: 1.7 g
sodium salt of EDTA: 1.7 g
potassium metabisulphite: 40 g
1-phenyl-5-mercaptotetrazole: 35 g
sodium hydroxide and water to make: 1 liter at pH 11.8.

4,108,662

PROCESS FOR DEVELOPING PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS FOR THE GRAPHIC ARTS

Katsumi Hayashi; Yoo Iijima, and Eiichi Okutsu, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

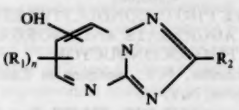
Filed Jan. 26, 1977, Ser. No. 762,594

Claims priority, application Japan, Jan. 28, 1976, 51-8230

Int. Cl.[2] G03C *5/30*

U.S. Cl. 96—66.5 **6 Claims**

1. A process for developing a photographic light-sensitive material for the graphic arts which comprises image-wise exposing and infectiously developing a silver halide light-sensitive material comprising a support having coated thereon a silver halide emulsion layer containing at least 60 mol% silver chloride with an infectious developing solution comprising (1) a hydroquinone, (2) an alkali, (3) up to 5 g/l of developer of an alkali metal sulfite salt, (4) an aldehyde-alkali metal-bisulfite adduct, and (5) a compound represented by the general formula (I):



(I)

wherein R_1 and R_2, which may be the same or different, each is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an aryl group having up to 12 carbon atoms, or a halogen atom; and n is 1 to 2; and said developer containing potassium ion and sodium ion in a ratio of potassium ion to the sum of potassium and sodium ion of not less than about one-half.

4,108,663

PHOTOGRAPHIC DEVELOPING AGENTS, PROCESS FOR DEVELOPING USING SAME, AND LIGHT-SENSITIVE MATERIALS CONTAINING SAME

Mitsugu Tanaka; Masaki Okazaki; Toshiaki Aono, and Takeshi Hirose, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

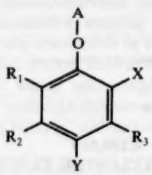
Filed Nov. 3, 1976, Ser. No. 738,420

Claims priority, application Japan, Nov. 7, 1975, 50-133693

Int. Cl.[2] G03C *3/00, 1/48, 1/06, 5/30*

U.S. Cl. 96—74 **12 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion layer, with a layer of the photographic material containing a photographic developing agent represented by the formula (I):



(I)

wherein one of X and Y is a group which inhibits development on release immediately after a developing agent is oxidized at development and is connected to the benzene ring in the agent represented by formula (I) by a sulfur, selenium or nitrogen atom, and the other of X and Y is an —NH—SO_2—Z group wherein Z is an alkyl group, an aryl group, or a heterocyclic group; A is a hydrogen atom or a group hydrolyzable under alkaline conditions; R_1, R_2 and R_3, which can be the same or different, each is a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, an alkoxy group, an aryloxy group, an —S—Z′ group wherein Z′ is an alkyl group, an aryl group or a heterocyclic group, an —NH—SO_2—Z″ group wherein Z″ is an alkyl group, an aryl group or a heterocyclic group, an acylamido group, an amino group, a halogen atom, a hydroxy group, or an acyloxy group; and R_1 and R_2 further may combine to form a ring.

4,108,664

LIGHT-SENSITIVE NEGATIVE-WORKING FILM CONTAINING A DIAZO OXIDE SENSITIZER AND A P-TOLUENESULFONYL HALIDE OR A 2,4-DIHALO-S-TRIAZINE

Henri G. J. de Boer, Delft; Gerrit van der Breggen, Krommenie, and Anton Wemmers, Den Hoorn (Delft), all of Netherlands, assignors to GAF Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,566

Int. Cl.[2] G03C *1/52*

U.S. Cl. 96—75 **2 Claims**

1. A light-sensitive negative working diazo type film comprising:

a. a support,

b. a carrier coating thereon, and,

c. a light-sensitive layer including a diazo oxide sensitizer and an additive therefor, wherein said additive is p-toluenesulfonylchloride or 2,4-dichloro-6-(4'-hydroxyphenyl-amino)-S-triazine, the proportions of sensitizer to additive being about 5–15 parts by weight to about 1–15 parts by weight, respectively.

4,108,665

STABILIZERS FOR PHOTOTHERMOGRAPHIC CONSTRUCTIONS

Gustav Gutman, Maplewood, and Edward Goettert, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 7, 1976, Ser. No. 730,678

Int. Cl.[2] G03C *1/02, 5/30, 5/24, 1/34*

U.S. Cl. 96—114.1 **5 Claims**

1. A photothermographic imaging layer comprising a reducible silver source, photographic silver halide in catalytic proximity to said silver source, a reducing agent for silver ion, and a binder, said imaging layer being further characterized by the presence of a stabilizing amount of at least one compound selected from

$$CRBr_2CR^1R^2R^3$$

wherein

R is Br or Cl,

R^1 is independently H, alkyl, phenyl, or naphthyl,

R^2 is independently H, alkyl or phenyl, and

R^3 is OH, alkoxy, trihydrocarbylsiloxy, carbamate, sulfonate, carbonate, phosphate, or carboxylate.

4,108,666

MONOFUNCTIONAL MONOMER-CONTAINING PHOTOSENSITIVE COMPOSITION FOR PHOTORESIST

Nobuyuki Hayashi; Asao Isobe; Katsushige Tsukada, and Toshiaki Ishimaru, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

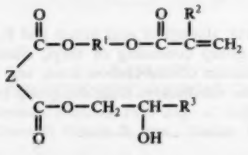
Filed Mar. 11, 1976, Ser. No. 665,883

Claims priority, application Japan, Apr. 11, 1975, 50-44719

Int. Cl.[2] G03C *1/68*

U.S. Cl. 96—115 P **14 Claims**

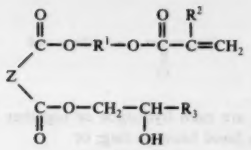
1. A photosensitive composition for a photoresist which comprises (A) a compound having the following general formula:



(I)

wherein Z is a cyclic dibasic acid anhydride moiety, R^1 is an alkylene group having 1 to 3 carbon atoms, R^2 is hydrogen or methyl, and R^3 is hydrogen, methyl, ethyl or $—CH_2X$ in which X is chlorine or bromine, (B) a photopolymerization sensitizer, (C) a polymer capable of giving a film-forming property, (D) a chain transfer agent having a chain transfer constant of more than 10 liters/mole.sec. to polymethyl methacrylate radical at 60° C and (E) a thermal polymerization inhibitor.

8. A laminated photosensitive element for a photoresist which comprises a flexible support and a substantially dry photosensitive layer thereon comprising (A) a compound having the following general formula:



wherein Z is a cyclic dibasic acid anhydride moiety, R^1 is an alkylene group having 1 to 3 carbon atoms, R^2 is hydrogen or methyl, and R^3 is hydrogen, methyl, ethyl or $—CH_2X$ in which X is chlorine or bromine, (B) a photopolymerization sensitizer, (C) a polymer capable of giving a film-forming property, (D) a chain transfer agent and (E) a thermal polymerization inhibitor.

4,108,667

PHOTOGRAPHIC COMPOSITIONS AND ELEMENTS CONTAINING BENZO[A]QUINOLIZINIUM METHINE DYES

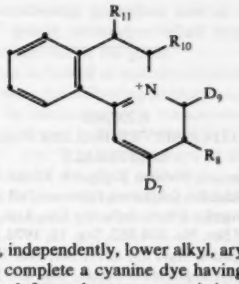
Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 556,499, Mar. 7, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 723,873

Int. Cl.[2] G03C *1/16*

U.S. Cl. 96—131 **4 Claims**

1. A light sensitive silver halide composition spectrally sensitized with a cyanine or merocyanine dye wherein one of the nucleu of said dye is a benzo[a]quinolizinium nucleus or a 6,7-dihydrobenzo[a]quinolizinium nucleus, said cyanine or merocyanine dye being represented by the structural formula:



where

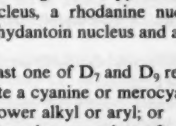
D_7 and D_9 are, independently, lower alkyl, aryl or the atoms required to complete a cyanine dye having a second nucleus selected from the group consisting of a thiazole nucleus, an oxazole nucleus, a selenazole nucleus, a thiazoline nucleus, a quinoline nucleus, an indole nucleus, a pyridine nucleus, an imidazole nucleus and an imidazoquinoxaline nucleus;

or a merocyanine dye having a second nucleus selected from the group consisting of a 2-pyrazolin-5-one nucleus, a pyrimidine nucleus, a rhodanine nucleus, a hydantoin nucleus, a thiohydantoin nucleus and an oxazolidinedione nucleus;

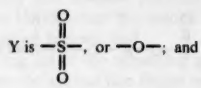
provided that at least one of D_7 and D_9 represents the atoms required to complete a cyanine or merocyanine dye;

R_8 is hydrogen, lower alkyl or aryl; or

R_8 and D_9, taken together, complete a fused carbocyclic ring of 5 or 6 carbon atoms or a fused ring having the structure

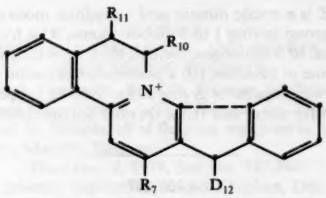


where



Y is $-\overset{\overset{O}{\|}}{\underset{\underset{O}{\|}}{S}}-$, or $-O-$; and

R_{10} and R_{11} are each hydrogen or together form a double bond or a fused benzene ring; or



where

R_7 is lower alkyl or aryl;

R_{10} and R_{11} are each hydrogen or together form a double bond or a fused benzene ring; and

D_{12} represents the atoms required to complete a cyanine dye having a second nucleus selected from the group consisting of a thiazole nucleus, an oxazole nucleus, a selenazole nucleus, a thiazoline nucleus, a quinoline nucleus, an indole nucleus, a pyridine nucleus, an imidazole nucleus and an imidazoquinoxaline nucleus; or a merocyanine dye having a second nucleus selected from the group consisting of a 2-pyrazolin-5-one nucleus, a pyrimidine nucleus, a rhodanine nucleus, a hydantoin nucleus, a thiohydantoin nucleus and an oxazolidinedione nucleus.

4,108,668

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Kaiichiro Sakazume; Noboru Fujimori; Eiichi Sakamoto, all of Hino, and Hidehiko Ishikawa, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 504,952, Sep. 11, 1974, abandoned. This application Apr. 29, 1977, Ser. No. 792,125

Claims priority, application Japan, Sep. 13, 1973, 48-102610

Int. Cl.[2] G03C *1/18*

U.S. Cl. 96—135 **10 Claims**

1. A light sensitive silver halide photographic material containing at least one sensitizing dye selected from the group consisting of:

(1) 1'-Carbamoylmethyl-3-ethyl-6,7-benzothia-4'-carbocyanine chloride,

(2) 1'-Carbamoylmethyl-3-ethyl-4,5-benzothia-4'-carbocyanine iodide,

(3) 1'-Carbamoylmethyl-3-ethyl-6-methoxy-4,5-benzothia-4'-carbocyanine chloride,

(4) 1'-Carbamoylmethyl-3-ethyl-6'-methyl-4,5-benzothia-4'-carbocyanine chloride,

(5) 1'-Carbamoylmethyl-3-ethyl-6'-methoxy-4,5-benzothia-4'-carbocyanine chloride,

(6) 1'-Diethylcarbamoylmethyl-3-ethyl-4,5-benzothia-4'-cyanine iodide,

(7) Anhydro-1'-carbamoylmethyl-3-(3-sulfopropyl)-5,6-benzothia-4'-carbocyanine hydroxide,

(8) 1'-Carbamoylmethyl-3-ethyl-6,7-benzoselena-4'-carbocyanine chloride, and

(9) 1'-Carbamoylmethyl-3-ethyl-4,5-benzoxa-4'-carbocyanine iodide.

4,108,669

SNOW AND ICE CONTROL COMPOSITION

Joseph V. Otrhalek, Dearborn, and Gilbert Stephen Gomes, Southgate, both of Mich., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Jan. 3, 1977, Ser. No. 756,180

Int. Cl.[2] C09K *3/18*

U.S. Cl. 106—13 **4 Claims**

1. A snow and ice control composition comprising a particulate calcined montmorillonite clay having a particle size in the range of from about 0.25 mm to about 5 mm, which contains from about 1 to about 20 percent by weight ammonium nitrate and from about 5 to about 9 percent by weight water.

4,108,670

POROUS REFRACTORY METAL BORIDE ARTICLE HAVING DENSE MATRIX

Roger A. Steiger, Canal Fulton, Ohio, and Frederick G. Stroke, McMurray, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,031

Int. Cl.[2] G01B *35/04*

U.S. Cl. 106—40 R **6 Claims**

1. A cold pressed and sintered refractory Group IVb metal diboride article having an overall density of between about 50 and 90 percent of the theoretical density of the metal diboride and a matrix of at least 95 percent of the theoretical density, the matrix having a microstructure characterized by predominantly contiguous grain boundaries and a fine grain size, the article having between about 5 and 50 percent of its volume in pores of between 4 and 1000 microns in nominal sectional diameter.

4,108,671

DYE-BASED INKS WITH IMPROVED VEHICLES

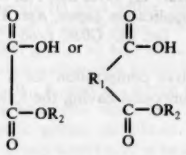
Milton Richlin, 6416 Dorcas St., Philadelphia, Pa. 19111

Filed Apr. 12, 1976, Ser. No. 676,047

Int. Cl.[2] C09D *11/00*

U.S. Cl. 106—22 **7 Claims**

1. In an ink consisting of a dye and an improved vehicle therefor the improvement consisting of an improved organic vehicle composed of compounds having the following molecular structure:



where R_1 is an alkyl, alkenyl or aryl group and R_2 is an ester moiety from the group consisting of alkyl, alkenyl or aryl group, with a minimum of one carbon atom, and which may include one or more substituents from the group consisting of —(OH), and —(O).

4,108,672

ALUMINA CORE FOR CASTING DS MATERIALS

Frederic J. Klug, Amsterdam, and Wayne D. Pasco, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,981

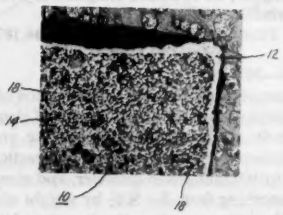
Int. Cl.[2] B28B *7/30, 7/34*

U.S. Cl. 106—38.9 **6 Claims**

1. A core suitable for use in investment casting comprising a shaped body of ceramic material including a central portion and an integral outer portion enclosing the central portion therein,

the ceramic material of the central portion is characterized

by a porous microstructure, wherein the porosity content is greater than 20 percent by volume, and is characteristic of grains which have undergone vapor phase transport action, and



the ceramic material of the integral outer portion is characterized by a dense layer of the same ceramic material as that of the central portion.

4,108,673

OPTICAL PHOSPHATE GLASS IN WHICH THE LENGTH OF THE LIGHT PATH IS TEMPERATURE INDEPENDENT

Hisayoshi Toratani, Hidaka, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,336
Claims priority, application Japan, Dec. 22, 1976, 51-155374
Int. Cl.[2] C03C *3/16*
U.S. Cl. 106—47 Q **1 Claim**

1. A phosphate optical glass having an Abbe number in the range of 51 to 33, a refractive index (*nd*) of 1.57 to 1.68, and whose length of the light path is substantially independent of temperature, consisting essentially of in % by weight,

P_2O_5	27 - 55
K_2O	6 - 26
BaO	10 - 50
K_2O + BaO	larger than 35
Al_2O_3	2 - 15
TiO_2 + Nb_2O_5 + Ta_2O_5	4 - 20
TiO_2	0 - 14
Nb_2O_5	0 - 20
Ta_2O_5	0 - 7
B_2O_3	0 - 5
Li_2O	0 - 2
Na_2O	0 - 5
MgO	0 - 6
CaO	0 - 8
SrO	0 - 10
ZnO	0 - 10
PbO	0 - 13, and
As_2O_3	0 - 2.

4,108,674

PHOTOTROPIC OPTICAL GLASS

Georg Gliemeroth, Finthen, Fed. Rep. of Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 541,671, Jan. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,437, Aug. 9, 1974, abandoned. This application Oct. 18, 1976, Ser. No. 733,046
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1974, 2404752
Int. Cl.[2] C03C *3/26*
U.S. Cl. 106—53 **5 Claims**

1. A phototropic glass having the following starting composition in weight percent:

SiO_2	12.1 to 13.9
P_2O_5	30.4 to 33.9
Al_2O_3	22.5 to 25.7
ZrO_2	1.0 to 2.6
Na_2O	3.0 to 7.5
K_2O	5.3 to 10.5
CaO	3.1 to 5.0
BaO	3.1 to 7.0
SrO	0 to 0.5
PbO	0.4 to 2.5
TiO_2	0.0 to 0.6
La_2O_3	0.00 to 2.0
Ag_2O	0.10 to 1.0
CuO	0 to 0.1

and at least one halogen selected from the group consisting of bromine and chlorine in an amount sufficient to provide upon analysis 0.2–1.0 wt.% of bromine plus chlorine in the glass, said glass upon analysis containing 0.05–0.5 wt.% Ag calculated as Ag_2O, the sum of the alkali earth oxides being 8.6–12.5 wt.%, the sum of the alkali oxides being 11.2–16.2 wt.%, wherein:

the glass contains as the essential phototropic agent a non-crystalline separation phase rich in said silver and said halogen, said silver-rich and halogen-rich, non-crystalline phase separations having a diameter between 40 and 350 A; compared to said non-crystalline separation phase, less than 10% thereof being present in a silver halide crystalline phase; the glass shows substantially no devitrification in the range between 10^1 and 10^5 poises;

the glass has a refractive index n_d between 1.5225 and 1.5238, a linear thermal expansion coefficient between 20° and 300° C of from about 99 to about 105 × 10^{-7} per degree C, and a sufficient chemical stability, characterized by a titration value in accordance with DIN 12,111 of less than 0.2 ml HC1, and ophthalmic pressing thereof can be made by normal production procedures for such pressings;

the glass can be strengthened chemically by ion exchange in a medium containing potassium ions at a temperature below $10^{14.5}$ poises, whereupon alkali ions smaller than potassium diffuse out of the glass;

and the glass has sufficient of said non-crystalline separation phase to possess the following phototropic properties, as determined by monochromatic transmissions at 545 nm, with excitation by an unfiltered xenon light of an intensity of 2 cal cm^{-2} min^{-1}, at a temperature of 20° C, on 2 mm thick specimens of the glass; a darkening of at least 50% transmission difference and a regeneration of the transmission after 10 minutes of at least 20% after the end of the illumination.

4,108,675

BRICK FOR SLIDING CLOSURE OF VESSEL FOR HOLDING MOLTEN METAL

Yoshimori Tomita, Tajimi; Hideyoshi Ozeki, Gifu, and Hisashi Takashima, Tajimi, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Tokyo Yogyo Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 651,143, Jan. 21, 1976, abandoned. This application May 11, 1977, Ser. No. 795,904
Claims priority, application Japan, Jan. 29, 1975, 50-11400
Int. Cl.[2] C04B *35/52*
U.S. Cl. 106—56 **10 Claims**

1. In a vessel for holding molten metal which comprises an outlet having a slide closure in the form of a brick, the improvement comprising a brick which is impermeable to said molten metal and is made by forming and subjecting to reducing-burning a composition comprising an acid or neutral refractory material as a base material, 3 to 10% of graphite powder, and a binding agent selected from the group consisting of clay; tar; pitch; a mixture of tar and pitch; lignin; ammonium alginate; and phenolic resins.

4,108,676

MIXED OXIDE COMPOUNDS FOR CASTING ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,758
Int. Cl.[2] C01F *17/00, 7/02;* C04B *35/44, 35/50*
U.S. Cl. 106—65 2 Claims

1. A ceramic article suitable for use in the casting and directional solidification of advanced superalloy materials comprising

a mixed oxide compound material $La_2O_3 \cdot 11Al_2O_3$, and

a porosity content which is from about 10 percent by volume to about 70 percent by volume.

4,108,677

PROCESS FOR TREATING WASTE SLUDGE FROM COMBUSTION PLANT DESULFURIZATION UNITS AND CEMENTITIOUS PRODUCT OF THE PROCESS

Richard E. Valiga, 1927 Queen's Wood Dr., York, Pa. 17403

Continuation-in-part of Ser. No. 610,269, Sep. 4, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,510
Int. Cl.[2] C04B *11/00*
U.S. Cl. 106—109 7 Claims

1. A method for hardening inorganic aqueous waste sludge which comprises as its non-aqueous ingredient calcium salts selected from the class consisting of calcium sulfate and calcium sulfite and wherein at least 30 percent by weight of the solids are calcium sulfite hemihydrate, including the steps of:

(1) thickening the said sludge by removing at least a portion of the liquid content;

(2) withdrawing a first portion of the thickened sludge, removing volatile liquids from the said first portion and calcining the residual solids from said first portion at 250° to 650° C to produce a dry, calcined intermediate product which comprises essentially dry, cementitious ingredients selected from the class consisting of calcium sulfate soluble anhydrite, calcium sulfate anhydrite and anhydrous calcium sulfite;

(3) withdrawing a second portion of the thickened sludge, and

(4) mixing the said partially dewatered sludge and at least a portion of the said intermediate product to produce a hardenable product.

4,108,678

RELEASE AGENT AND METHOD

Bernard F. Szuhaj, Lombard, and Joseph R. Yaste, Hoffman Estates, both of Ill., assignors to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Jan. 12, 1977, Ser. No. 758,716
Int. Cl.[2] C08L *91/00*
U.S. Cl. 106—243 4 Claims

1. A method of preparing a sprayable pan release product comprising mixing lecithin and a tri-glycol ester having fatty acid chains of from 6 to 12 carbon atoms at a temperature sufficient to form a solution thereof, cooling the mixture to about 90° F., adding thereto an alcohol, said alcohol being present in an amount of about 20% to about 25% of the weight of said product, said lecithin being present in the range of about 5% to about 30% with the remainder being a member selected from the class consisting of said tri-glycol ester and a mixture of said tri-glycol ester and a second tri-glycol ester having fatty acid chains of from 16 to 18 carbon atoms, and thereafter placing the mixture in a mechanical dispensing container whereby dispensing is achieved without the use of an aerosol propellant.

4,108,679

PIGMENT COMPOSITION CONTAINING ELEMENTAL CARBON AND PROCESS OF MAKING THE SAME

Michael F. Szczepanik, Allen Park; Joseph F. Sryniawski, Lincoln Park; Adolph Busseman, Detroit, and Robert D. Shannon, Ann Arbor, all of Mich., assignors to Ebonex Corporation, Melvindale, Mich.

Filed Nov. 22, 1976, Ser. No. 744,187
Int. Cl.[2] C09C *1/48*
U.S. Cl. 106—307 2 Claims

1. A process of manufacturing a composition of matter comprising the steps of forming a dry mixture of elemental carbon having a finely particulate structure on the order of 1/100 micron in diameter; a particulate filler of a particle size on the order of 50 to 100 microns in diameter, said elemental carbon particles comprising from 5 – 50% by weight of said mixture; grinding said mixture to reduce the diameter of the filler particles to a size in the range of 1 – 20 microns and produce a deposition of said elemental carbon particles upon the outer surface of said filler particles.

4,108,680

PROCESS FOR REMOVING CALCIUM OXALATE SCALE

James W. Barr, Jr., Rothschild, Wis., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 642,452, Dec. 19, 1975, abandoned. This application Mar. 16, 1977, Ser. No. 777,968
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—3 4 Claims

1. A process for removing calcium oxalate scale from a metal surface of an apparatus used for thermal treatment of aqueous solutions and suspensions which comprises contacting said scale with an aqueous suspension containing from 3% to 25% by weight of nitric acid and from 1% to 10% by weight of manganese dioxide, at a temperature between 20° C. and 95° C., said metal surface being one for which the rate of corrosion caused by said suspension is less than about 30 mils of penetration per year.

4,108,681

METHOD FOR DISSOLVING ASPHALTIC MATERIAL

Michael B. Lawson, and Kenneth J. Snyder, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 607,653, Aug. 25, 1975, Pat. No. 4,033,784. This application May 9, 1977, Ser. No. 794,768
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—20 18 Claims

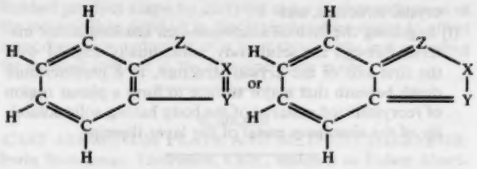
1. A method for dissolving asphaltic material comprising:

establishing contact between said asphaltic material and a composition comprising a liquid aromatic solvent and an additive material soluble in said liquid aromatic solvent, and

maintaining said contact for a time sufficient to dissolve said asphaltic material;

wherein said liquid aromatic solvent has a flash point of at least about 160° F and is a mixture of aromatic compounds selected from alkyl substituted benzene compounds having 1 to 10 carbon atoms per alkyl substituent, naphthalene, and alkyl substituted naphthalene having 1 to 10 carbon atoms per alkyl substituent; and

wherein said additive material is selected from fused heterocyclic ring compounds, alkyl substituted derivatives of said fused heterocyclic ring compounds and mixtures thereof: wherein said fused heterocyclic ring compounds are represented by the general formulae:



and wherein Z, X and Y are selected from nitrogen atoms, oxygen atoms, nitrogen-hydrogen groups and carbon-hydrogen groups wherein at least one of said Z, X, and Y must be nitrogen and wherein said additive is present in said composition in the range of from about 0.1 to about 50 percent by weight of said liquid aromatic solvent, and further

wherein said additive material is not benzotriazole.

4,108,682

PROCESS FOR FLUIDIZED CONTACT

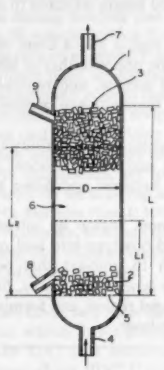
Hiroo Takeda, Kawasaki; Takeshi Kanda, Sagamihara; Yutaka Oguchi, Tokyo, and Naomasa Asano, Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Continuation of Ser. No. 521,030, Nov. 5, 1974, abandoned. This application Sep. 14, 1976, Ser. No. 723,300

Claims priority, application Japan, Nov. 7, 1973, 48/124550; Sep. 25, 1974, 49/109605

Int. Cl.[2] B01J *8/20, 8/22, 8/34*

U.S. Cl. 134—25 R **10 Claims**



1. A process for fluidized contact by contacting a liquid intimately with solid particles in a contacting vessel, which comprises forming a porous packed bed in at least a part of a contact zone of said contacting vessel by filling the contact zone with a porous packing, accommodating the solid particles in the lower part of the contact zone, introducing the liquid from the bottom of the contacting vessel to form a fluidized layer of solid particles within the contact zone, the upper end of the layer of the solid particles expanded by the fluidization being located within the porous packed bed, and withdrawing the liquid which has made contact from the upper part of the contacting vessel, said contact being performed under the following conditions:

(1) the ratio of superficial volume occupied by the porous packed bed to real volume of the porous packing is at least 1.3,

(2) the ratio of the average pore diameter of the pores of the porous packing to the average particle diameter of the solid particles is 1.1 to 10.0,

(3) $L_2/L = 0.3 - 0.9$ wherein L is the length of the contact zone extending from the bottom of the fluidized layer of solid particles to the top of the porous packed bed, and L_2 is the height of the fluidized layer of solid particles when they are in fluidization, and

(4) $U_{fl} < U_l < 12.0$ (cm/sec.) wherein U_l is the superficial liquid velocity in the contact zone based on the empty cross-section of the contacting vessel and U_{fl} is the minimum fluidization velocity of solid particles caused by the liquid.

4,108,683

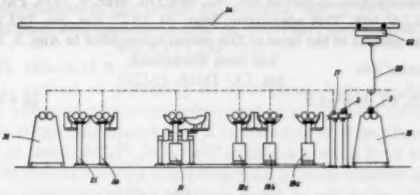
METHOD FOR AUTOMATICALLY PROCESSING PHOTOGRAVURE CURVILINEAR SURFACES

James K. Anderson, 1110 Rostrevor, Louisville, Ky. 40205

Continuation-in-part of Ser. No. 577,898, May 15, 1975, which is a continuation of Ser. No. 392,475, Aug. 29, 1973, abandoned. This application Sep. 10, 1976, Ser. No. 722,015

Int. Cl.[2] B41C *1/18*

U.S. Cl. 134—27 **6 Claims**



1. A method for processing photogravure curvilinear surfaces comprising the steps of:

placing a first photogravure curvilinear surface onto an etching station;

rotating said first surface and simultaneously therewith spraying an etching solution thereon for a preselected period of time;

removing said first surface from said etching station, then placing said first surface onto an etch terminating station;

rotating said first surface and simultaneously therewith spraying an etch terminating solution thereon for a preselected period of time; and,

removing said first surface from said etch terminating station, the time of residence of said surface at each of said stations being generally the same thereby prompting the sequential continuous movement of surfaces from station to station.

4,108,684

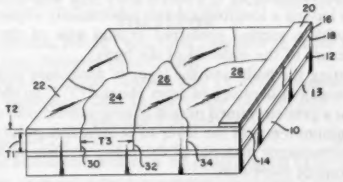
LARGE GRAIN THIN FILM POLYCRYSTALLINE P-INP/N-CDS SOLAR CELL

Kenneth W. Zanio, Agoura, and Lewis M. Fraas, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 735,560, Oct. 26, 1976. This application Sep. 29, 1977, Ser. No. 838,032

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 TF **2 Claims**



1. In a solar cell having adjacent layers of P and N type polycrystalline semiconductor material which define a PN junction boundary, the improvement comprising a layer of

N-type polycrystalline cadmium sulfide disposed on a chosen substrate material and having large grains with lateral grain boundaries on the order of about 20 micrometers or greater, and a layer of polycrystalline P-type indium phosphide disposed on said layer of polycrystalline cadmium sulfide and having a thickness on the order of between 1.0 and 4.0 micrometers and further having large replicated grain boundaries with lateral dimensions and spacings approximately the same as the lateral dimensions and spacings of said large grains of cadmium sulfide, whereby the lateral grain dimensions in said cadmium sulfide and indium phosphide layers are maximized while the quantity of indium in said solar cell is minimized.

4,108,685

SEMICONDUCTOR DEVICE MANUFACTURE

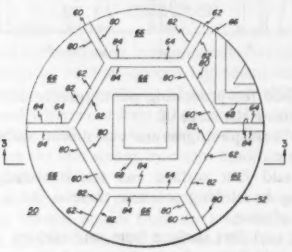
Mike F. Chang, Liverpool; Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 665,276, Mar. 9, 1976, Pat. No. 4,040,868. This application Mar. 31, 1977, Ser. No. 783,167

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.[2] H01L *21/225*

U.S. Cl. 148—1.5 **34 Claims**



1. An improved method for migrating a melt of aluminum-rich semiconductor material through a solid body of the semiconductor material including the process steps of:

(a) selecting a body of single crystal semiconductor material, wherein the semiconductor material is one selected from the group consisting of silicon, silicon carbide, germanium and gallium arsenide, and having two major opposed surfaces comprising the top and bottom surfaces thereof, a predetermined type conductivity, a predetermined level of resistivity, a preferred diamond cubic crystal structure, a preferred planar crystal orientation for at least one of the major surfaces which is one selected from the group consisting of (111), (100) and (110), a vertical axis substantially perpendicular to the opposed major surfaces, and a first preferred crystal axis substantially parallel with the vertical axis and substantially perpendicular to the opposed major surfaces;

(b) vapor depositing a layer of aluminum metal on the major surface having a preferred planar crystal orientation, the layer having a preferred width and a preferred thickness and so oriented as to form at least one aluminum metal wire having a longitudinal axis substantially aligned parallel with a second preferred crystal axis of the crystal structure of the material of the body;

(c) heating the body and the layer of aluminum metal to an elevated temperature of from about 577° C to about 660° C for a predetermined period of time sufficient to alloy the aluminum metal of the layer to at least that portion of the semiconductor material of the major surface of the body in contact therewith;

(d) heating the body and the alloyed aluminum metal wire to a predetermined elevated temperature sufficient to form a melt of aluminum-rich semiconductor material on the surface of the body;

(e) establishing a temperature gradient substantially parallel to the vertical axis of the body and the first axis of the crystal structure; and

(f) migrating the melt of aluminum-rich semiconductor material through the solid body, substantially aligned with the first axis of the crystal structure, to a predetermind depth beneath that major surface to form a planar region of recrystallized material of the body having solid solubility of the aluminum metal of the layer therein.

4,108,686

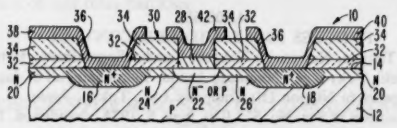
METHOD OF MAKING AN INSULATED GATE FIELD EFFECT TRANSISTOR BY IMPLANTED DOUBLE COUNTERDOPING

Lewis Alfred Jacobus, Jr., Middlesex, N.J., assignor to RCA Corp., New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 818,065

Int. Cl.[2] H01L *7/54, 29/78*

U.S. Cl. 148—1.5 **7 Claims**



1. A method of making an insulated gate field effect transistor in a body of semiconductor material of one type conductivity and having a surface, said transistor having a channel region of predetermined length adjacent to said surface comprising the steps of

forming a source region and a drain region each having a conductivity type opposite that of said body in said body adjacent to said surface, said regions having a predetermined distance therebetween greater than said predetermined length

forming a zone having a conductivity type opposite to that of said body in said body adjacent to said surface, said zone extending between and being less conductive than said regions,

forming said channel region by introducing conductivity modifiers of said one type into said zone over said predetermined length to convert that portion of said zone toward said one type conductivity, forming a gate insulator on said channel region, and forming a conductive gate on said gate insulator.

4,108,687

PROCESS FOR IMPROVING THE HEAT RESISTANCE OF ZIRCONIUM AND ITS ALLOYS

Marcel Armand, and Daniel Charquet, both of Albertville, France, assignors to Ugine Aciers, Paris, France

Filed Dec. 2, 1976, Ser. No. 746,950

Claims priority, application France, Dec. 12, 1975, 75 39403

Int. Cl.[2] C22F *1/18*

U.S. Cl. 148—2 **7 Claims**

1. In a process for improving the mechanical and corrosion resistance properties under heat of zirconium and zirconium alloys including up to about 3% hafnium by weight as an impurity and alloying elements selected from the group consisting of Fe, Cr, Ni, Mo, Cu, V, Sn and Nb, and wherein the zirconium or zirconium alloys comprise a significant portion of α phase within the temperature range of 830° to 950° C and which contain between about 150 and 400 ppm of carbon to strengthen the resistance to creep, the improvement comprising: casting the zirconium and zirconium alloys into ingots; effecting carbon solubilization by thermal or themo-mechanical treatment of said zirconium and zirconium alloys within said temperature range during transformation of the ingot into an intermediate product shape wherein a significant portion of α phase is present to solubilize at least a part of the carbon;

subsequently transforming the intermediate product shape to a finished product shape by carrying out a further reduction of the intermediate product in the α temperature range to effect ingot dimension reduction of at least about 50%; and annealing the finished product in the α temperature range.

4,108,688

CAST ALUMINUM PLATE AND METHOD THEREFOR

Irwin Broverman, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sep. 30, 1976, Ser. No. 728,366

Int. Cl.[2] C22F *1/04*; C22C *21/08*

U.S. Cl. 148—3 **16 Claims**

1. An essentially unworked aluminum alloy plate at least 6 inches thick formed from an aluminum alloy consisting essentially of about 3.8–6.0% magnesium, up to 1.0% manganese, silicon as an impurity or as an alloying addition in amounts greater than 0.05% but less than 0.50%, less than 0.50% iron, less than 0.3% copper, less than 0.4% chromium, less than 0.4% zinc and the balance aluminum and inconsequential amounts of other elements, said plate having been D.C. cast directly to size and characterized by having coarse, script-like Mg_2Si eutectic which forms during casting and then said plate having been homogenized at a temperature between about 1020° F and about 1070° F for at least 12 hours to dissolve part of the coarse, script-like Mg_2Si eutectic into the aluminum matrix and transform the remaining coarse, script-like Mg_2Si eutectic to an agglomerated, spherically shaped constituent having a particle size less than 25 microns in maximum dimension, and said plate characterized by exhibiting after fusion welding essentially no microcracks in the heat-affected zone of the plate which forms during welding due to the existence of coarse, script-like Mg_2Si eutectic which forms during casting.

6. A method of preparing an essentially unworked aluminum alloy plate at least 6 inches thick which exhibits essentially no microcracks in the heat-affected zone of said plate when fusion welded due to the existence of coarse, script-like Mg_2Si eutectic which forms during casting comprising the steps of

(a) preparing a molten aluminum alloy consisting essentially of about 3.8–6.0% magnesium, up to 1.0% manganese, silicon as an impurity or an alloying addition in amounts greater than 0.05% but less than 0.50%, less than 0.50% iron, less than 0.3% copper, less than 0.4% chromium, less than 0.4% zinc and the balance aluminum and inconsequential amounts of other elements,

(b) D.C. casting the molten alloy directly to the desired plate size at least 6 inches thick, said plate having coarse, script-like Mg_2Si eutectic which forms during casting, and

(c) homogenizing the D.C. cast aluminum alloy plate at a temperature between about 1020° F and about 1070° F for at least 12 hours, said homogenization dissolving part of the coarse, script-like Mg_2Si eutectic into the aluminum matrix and transforming the remaining coarse, script-like Mg_2Si eutectic to an agglomerated, spherically shaped constituent having a particle size less than 25 microns in maximum dimension.

4,108,689

PROCESS FOR IMPROVING THE SURFACES OF ROLLER BODIES AND BALLS

Wolfgang Peter, Hegnach; Heinz Koch, Fellbach, and Alfred Stubenvoll, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 475,984, Jun. 3, 1974, abandoned. This application Oct. 14, 1976, Ser. No. 732,352

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1973, 2329576

Int. Cl.[2] C23F *7/10*

U.S. Cl. 148—6.15 R **11 Claims**

1. A process for improving steel surfaces in mutual sliding contact, that have already been treated to obtain minor peak-to-valley height which comprises the steps of degreasing the steel surfaces in a mildly alkaline, aqueous degreasing bath at a pH of about 7 to 10; rinsing the degreased surfaces with cold tap water; browning the surfaces for about 15 to 20 minutes at approximately 128° to 135° C. in a single bath of a saturated aqueous solution of a salt material having approximately the following composition:

80-90% by weight of sodium hydroxide (NaOH)

5-15% by weight of sodium nitrite ($NaNO_2$), and

3-10% by weight of sodium phosphate, dibasic (Na_2HPO_4);

and rinsing the surfaces subsequently again with cold tap water.

4,108,690

METHOD FOR PRODUCING AN AMORPHOUS, LIGHT WEIGHT CALCIUM PHOSPHATE COATING ON FERROUS METAL SURFACES

Ferdinand P. Heller, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 674,024, Apr. 5, 1976, abandoned. This application Jan. 31, 1977, Ser. No. 764,096

Int. Cl.[2] C23F *7/10*

U.S. Cl. 148—6.15 R **14 Claims**

1. A method of producing an amorphous, light weight, tightly adherent calcium phosphate coating on a ferrous metal surface comprising applying, at a temperature of from about 50° F to about 160° F., to a metal surface a coating from an aqueous coating solution consisting of an aqueous solution of calcium phosphate and an oxidizing agent, in which the calcium phosphate is present in an amount of from about 0.01 to about 1.0 moles per liter as measured by the $Ca++$ cation and in which the pH of the solution is between about 3.0 and about 4.2 and said pH is as close as possible to, but does not exceed, the saturation pH of the calcium phosphate at said concentration and said temperature.

4,108,691

ALUMINIUM BASE ALLOYS

Michael James Stowell, Saffron Walden, and Brian Michael Watts, Kedington, both of England, assignors to T.I. (Group Services) Limited, Edgbaston, England

Filed Oct. 28, 1976, Ser. No. 736,745

Claims priority, application United Kingdom, Oct. 29, 1975, 44672/75

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—11.5 A **10 Claims**

1. A method of preparing a superplastically deformable aluminium base alloy, in which an aluminium alloy consisting essentially of aluminum and from 2 to 8.5% by weight magnesium and from 0.4 to 1% chromium together with optional minor alloying elements and normal impurities is subjected to hot and cold plastic deformation whereby there is produced in the alloy a stable finely dispersed phase comprising aluminum magnesium and chromium.

4,108,692

ROCK BIT ROLLER CUTTER AND METHOD THEREFOR

John R. Quinlan, Buena Park, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

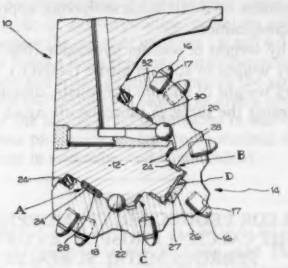
Continuation of Ser. No. 540,440, Jan. 13, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,025

Int. Cl.[2] C21D *9/22*

U.S. Cl. 148—12.3 **6 Claims**

1. In the manufacture of rock bit roller cutters to be mounted on friction journals, wherein a cutter comprises a roller body having pural peripherally distributed holes, and hard metal inserts press-fitted into said holes in outwardly projecting relation, the steps of forming the roller body of a maraging steel comprising a nickel-cobalt alloy, forming said body holes

therein, then age-hardening the roller body to a hardness of not less than 50 R_c under conditions maintaining dimensions of the



formed holes and thereafter press-fitting hard metal inserts into said roller body holes.

4,108,693

METHOD FOR THE HEAT-TREATMENT OF STEEL AND FOR THE CONTROL OF SAID TREATMENT

Mathurin L'Hermite, Versailles; Raymond Le Bossenec, Fontenay-le-Fleury; Pierre Godart, Plaisir, and François Pierrard, Versailles, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 534,301, Dec. 19, 1974, Pat. No. 4,035,203. This application Jun. 1, 1977, Ser. No. 802,521

The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.

Int. Cl.[2] C21D *1/48*

U.S. Cl. 148—16.5 **7 Claims**

1. A method of heat treatment of steel which comprises the steps of mixing a nitrogen-containing carrier gas and an active gas including a hydrocarbon selected from the group consisting of the compounds C_2H_4, C_2H_2 and C_2H_6, the mixture containing between 0.2% and 12% by volume of hydrocarbon, continuously introducing the thus formed mixture into a furnace containing the steel to be heat-treated to provide an atmosphere consisting substantially entirely of said mixture around the steel, heating the steel and the surrounding atmosphere to a temperature within the range of from 850° C. to 1050° C., continuously withdrawing the atmosphere from said furnace, measuring the residual content of hydrocarbon in the atmosphere withdrawn from said furnace, comparing the thus measured residual hydrocarbon content with a predetermined hydrocarbon content level to ascertain the proportion of carbon in the steel, and regulating the flow rate of hydrocarbon in the atmosphere being introduced into the furnace to provide a residual hydrocarbon content corresponding to the desired proportion of carbon in the steel.

4,108,694

CONTINUOUSLY CAST SLABS FOR PRODUCING GRAIN-ORIENTED ELECTRICAL STEEL SHEETS HAVING EXCELLENT MAGNETIC PROPERTIES

Morio Shiozaki; Yozo Suga; Hiromu Fujii, and Kohichi Fujiwara, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

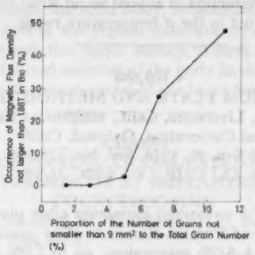
Filed Aug. 10, 1977, Ser. No. 823,451

Claims priority, application Japan, Aug. 10, 1976, 51-94468

Int. Cl.[2] B22D *27/02, 11/04*; H01F *1/04, 1/14*

U.S. Cl. 148—31.55 **3 Claims**

1. A continuously cast steel slab for production of a grain-oriented electrical steel sheet having excellent magnetic properties in which at least 95% of the total number of grains



constituting an equi-axed crystal zone in said slab has a cross sectional dimension less than 9 mm^2 per one grain.

4,108,695

STEEL WIRE

Hans Paulitsch; Alfred Babilon; Gerhard Kiefer; Kurt Koerfer, all of Salzgitter-Lebenstedt; Constantin Vlad, Wolfenbüttel, and Ullrich Kock, Salzgitter-Lebenstedt, all of Germany, assignors to Stahlwerke Peine-Salzgitter A.G., Pein, Hann, Germany

Continuation of Ser. No. 503,815, Sep. 6, 1974, abandoned. This application May 6, 1976, Ser. No. 683,783

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1973, 2345738

Int. Cl.[2] C22C *35/00*

U.S. Cl. 148—39 **2 Claims**

1. A steel wire adapted for cold drawing, the said wire having

a core portion consisting essentially of fine pearlite, segregated ferrite in said core portion being present in an amount of up to at most about 1% of the core portion, and

a surface portion enclosing said core portion and consisting essentially of fully tempered martensite, the said martensite surface portion constituting at most about 33% of the cross-sectional area of said wire whereby the wire has a good cold deformability for cold drawing operations in spite of its high surface strength.

4,108,696

SOLID PROPELLANT HAVING INCORPORATED THEREIN A FERROCENE COMBUSTION CATALYST

Charles I. Ashmore, Owens Cross Roads; Charles S. Combs, Jr., and William D. Stephens, both of Huntsville, all of Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Apr. 1, 1968, Ser. No. 717,945

Int. Cl.[2] C06B *45/10*

U.S. Cl. 149—19.2 **4 Claims**

1. A solid composite type propellant comprising in parts by weight of ammonium perchlorate, carboxy-modified polybutadiene, powdered aluminum, tris-(2-methylaziridinyl) phosphene oxide, a dibutylcarbitol formal plasticizer, to which is added as parts by weight in the percentage of 0.1 to 20 a ferrocene compound 1,3-diferrocenyl -1- butene which is of the structure Fc-R-Fc wherein Fc represents a ferrocene group and R is a radical selected from the group consisting of alkyl, cycloalkyl, alkenyl and cycloalkenyl radicals.

4,108,697

NOVEL TRIAMINOGUANIDINE NITRATE PROPELLANTS

Terrence P. Goddard, Aptos, Calif., assignor to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Continuation-in-part of Ser. No. 762,229, Jan. 24, 1977. This application Nov. 22, 1977, Ser. No. 853,917
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.3 4 Claims

1. A propellant comprising, by weight:
(A) a polymeric binder system, in the range 8–35 percent;
(B) curing agents, in the range 0–10 percent;
(C) plasticizing agents, in the range 0–25 percent;
(D) a composition having the general formula

$$x[(NHNH_2)_3CNO_3].(1-x)[((NHNH_2)_3C)_2B_{10}H_{10}]$$

wherein the value of x is between 0.01 and 0.99, in the range 35–90 percent.

4,108,698

ROMAN SHADE AND METHOD FOR MAKING SAME

Phillip L. Brookshire, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio

Division of Ser. No. 676,347, Apr. 12, 1976, Pat. No. 4,069,857. This application May 23, 1977, Ser. No. 799,542
Int. Cl.[2] B29C *27/00;* A47H *5/00*
U.S. Cl. 156—60 9 Claims

1. A method of making a plastic Roman shade having a top portion and a bottom portion and a plurality of spaced, horizontally extending pleats extending substantially from one side of said shade to another and between said top and said bottom portions, and pull strings for raising and lowering said shade, said method comprising the steps of:
folding said shade together, between said bottom and top portions, to form folded horizontal pleats,
heat sealing said shade in the areas of said folded pleats, to form said horizontally extending pleats in said shade, and
forming, on at least one side of said shade, pull string guide means in association with said horizontally extending pleats, said guide means for operatively holding shade pull strings therein.

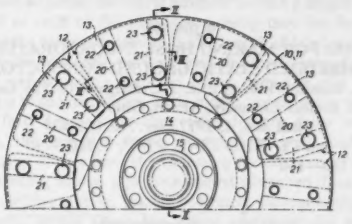
4,108,699

METHOD OF MAKING A FRICTION DISC

Gérard de Gennès, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Division of Ser. No. 639,123, Dec. 9, 1975, Pat. No. 4,022,310. This application Sep. 14, 1976, Ser. No. 723,302
Int. Cl.[2] B32B *7/08;* F16D *13/64*
U.S. Cl. 156—92 5 Claims

1. A method of manufacture of a friction disc of the progressive engagement type, said method comprising the steps of: first manufacturing three elements constituted by two flat annular friction linings and a cut-out and corrugated support; coating with adhesive at least a part of these elements at least over the regions corresponding to glueing zones which zones include the parts of the corrugations of the support which are in contact with said linings; and carrying out a riveting operation with rivets in said glueing zones before setting of the adhesive, whereby said rivets play the part of a joint-clamping means during the setting of said adhesive.

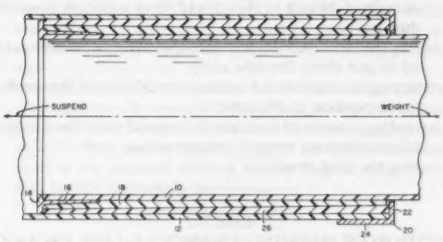


4,108,700

METHOD OF MAKING CONED JOINT FOR JOINING DISSIMILAR DIAMETER FILAMENT WOUND TUBES

Glen A. Clodfelter, Madison, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 5, 1977, Ser. No. 794,329
Int. Cl.[2] B29C *17/12;* B32B *1/10*
U.S. Cl. 156—153 1 Claim



1. A method for joining two filament wound tubes having dissimilar diameters comprising: attaching a step face ring to the mating end of a smaller diameter tube;
overwrapping the smaller diameter tube and part of said ring with a first glass cloth/resin system which tapers inwardly away from said mating end;
curing and preparing the surface of said overwrap to the conical taper required;
adhesively bonding a joint ring to the mating and of a larger diameter tube;
forming a taper joint ring by wrapping a second glass cloth/resin system onto a cone shaped mandrel, said mandrel having a taper substantially the same as that of said first glass cloth/resin system;
grinding the taper joint ring to length and diameter required to fit inside larger diameter tube;
cutting the taper joint ring into two halves;
assembling and bonding said taper joint ring halves into said mating end of said larger diameter tube such that said taper joint ring tapers inwardly from said mating end and abuts said joint ring;
assembling the mating end of the smaller diameter tube within the mating end of the larger diameter tube such that the tapered surface of said first glass cloth/resin system is in mating relationship with the tapered surface of the taper joint ring and the step face ring abuts the taper joint ring;

adhesively bonding the exterior of said first cloth/resin system to the interior of the taper joint ring and

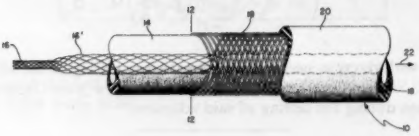
hanging the mated tubes vertically until the components are bonded.

4,108,701

METHOD FOR MAKING HOSE INCORPORATING AN EMBEDDED STATIC GROUND CONDUCTOR

John H. Stanley, Libertyville, Ill., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 1, 1977, Ser. No. 802,404
Int. Cl.[2] B29D *23/04, 23/05;* **H01B** *7/30*
U.S. Cl. 156—160 **6 Claims**



1. A method of manufacturing a hose structure incorporating an embedded static ground conductor comprising the steps of:

extruding an elastomeric tube;

pressurizing the tube to effect a substantially rounded cross-section;

shortening a loosely braided wire bundle conductor in its axial direction such that the individual wires of the bundle are formed in a sinusoid transversely of the bundle axis;

compressing the shortened wire bundle in a direction transversely of its axis to flatten and form a ribbon type conductor;

laying the ribbon conductor onto the elastomeric tube parallel to and along the tube axis;

wrapping the tube with a textile material to hold the conductor in position on the tube;

extruding a cover of elastomeric material over the wrapped tube to form an integral hose structure; and

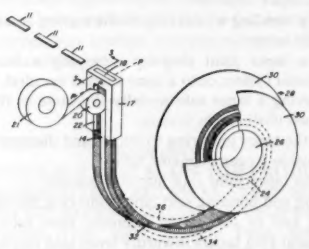
curing the hose structure.

4,108,702

METHOD OF FORMING AN ARTICLE-TAPE PRODUCT

Richard D. Welch, Pittsford, and John E. Iversen, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 615,031, Sep. 19, 1975, which is a division of Ser. No. 483,586, Jun. 27, 1974, abandoned. This application Mar. 11, 1977, Ser. No. 777,237
Int. Cl.[2] B31C *13/00;* **B65B** *15/04*
U.S. Cl. 156—192 **9 Claims**



1. A method of handling a plurality of articles, each having a thick marginal edge and an opposite thinner marginal edge, by adhering the articles to a tape having an adhesive surface to form an article-tape product, said method comprising the steps of:

tilting said articles at said article collection station so that said thick marginal edge of each article is below its opposite thinner marginal edge;

stacking said tilted articles one on top of another at said article collecting station with corresponding thick marginal edges of said articles in alignment;

applying the adhesive surface of the tape to said aligned thick marginal edges of said stack to form an article-tape product;

and removing the article-tape product from the article collecting station.

3. A method for adhering rupturable photographic pods onto a tape to form a photographic pod-tape product wherein the pod is of the type formed from a single sheet of deformable material folded along one marginal edge to form a pair of overlapping rectangular walls secured to one another along the remaining marginal edges to form a cavity containing a liquid photographic processing agent, each pod being thicker along said folded marginal edge than the opposite secured marginal edge, comprising the steps of:

feeding photographic pods one at a time to a pod collecting station with each pod in the same predetermined orientation relative to the station;

tilting said pods at said pod collecting station with said folded marginal edge of each pod lower than said opposite secured marginal edge;

stacking said tilted pods at said pod collecting station to form a stack of tilted pods having said folded marginal edges in register; and

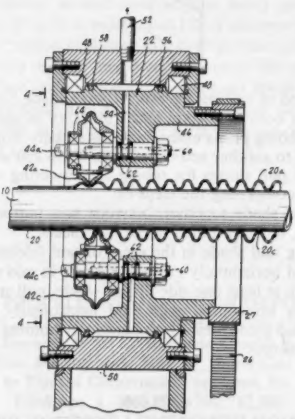
applying the adhesive surface of a tape into engagement with said registered folded marginal edges of said stack to form a photographic pod-tape product.

4,108,703

METHOD AND APPARATUS FOR PRODUCING DOUBLE-WALLED THERMOPLASTIC PIPE

Leslie J. Kovach, 880 Fifth Ave., New York, N.Y. 10021

Filed May 20, 1977, Ser. No. 798,867
Int. Cl.[2] B29C *15/00;* **B29D** *23/04*
U.S. Cl. 156—244.13 **16 Claims**



1. A method of producing a double-walled pipe of thermoplastic material comprising forming an outer pipe of thermoplastic material over and concentric with an inner pipe of thermoplastic material, and passing said outer and inner pipes through an assembly which rotates about the longitudinal axis of said pipes and which carries a plurality of freely rotatable forming rollers positioned in a helical path about said pipes, which rollers act by vacuum upon the outer surface of the outer pipe so as to form it into the shape of a helical thread about the outer surface of said inner pipe.

4,108,704

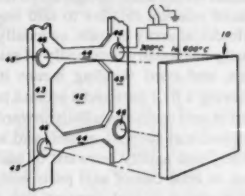
METHOD OF MAKING AN ARRAY OF SOLAR CELLS

William E. Horne, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 764,383, Jan. 31, 1977. This application Aug. 1, 1977, Ser. No. 820,505

Int. Cl.[2] B29C *19/02, 19/06*

U.S. Cl. 156—272 8 Claims



1. The method of making a bond between a substrate and a solar cell capable of converting incident electromagnetic wave energy into electrical power, the method including the steps of:

locating a glass support pad upon a substrate,

bonding said support pad onto said substrate to provide a smooth, outwardly-facing support surface on the pad,

arranging said solar cell upon the outwardly-facing support surface of the pad,

heating the solar cell and support pad to a temperature within the range of about 300° C to about 600° C,

establishing an electrical field at a desired preselected voltage along the interface region between the solar cell and the support pad in a manner such that said glass support pad has a negative electrical potential with respect to the solar cell,

maintaining said electrical field between the heated support pad and the heated solar cell for a period of time sufficient to form a molecular bond, and

thereafter ccoling the solar cell and support pad and removing the establishing electrical field.

4,108,705

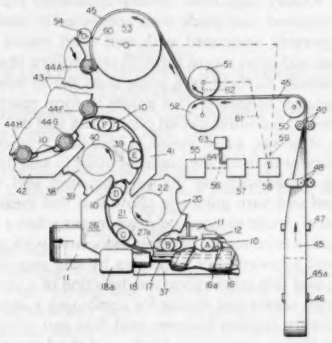
BOTTLE OPERATED LABEL FEED SWITCH MECHANISM

Clyde F. Hadl, and Shepard L. Harmon, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 7, 1977, Ser. No. 785,634

Int. Cl.[2] B26D *5/00*

U.S. Cl. 156—355 4 Claims



1. In a bottle labelling machine having a rotary turret and a plurality of sleeve forming mandrels thereon, pocketed wheel means on the turret beneath the mandrels, the pockets thereof adapted to receive upright bottle and carry them on the turret means connected for driving the turret and its said pocketed means in continuous rotation, in axial alignment with the mandrels, a first power-operated continuously operable, moving horizontal infeed conveyor for advancing bottles thereon in upright position to the turret, a web supply of label material, a feed drum adjacent the turret adapted to feed a length of label material to each of the mandrels moving past the feed drum adjacent the turret adapted to feed a length of label material to each of the mandrels moving past the feed drum at a label loading station, web advancing means engaging said web for moving it to the feed drum, knife means operatively connected to the feed drum for cutting label lengths from said web thereon, the mandrels being operated to wrap said length thereon and form a label sleeve during turret rotation from the sleeve loading station a predetermined advanced distance to a bottle labelling station, the improvement therein comprising:

a timing means along the infeed conveyor for engaging upright bottles moving thereon and equally spacing and timing them to correspond with the turret pockets,

means advancing the upright bottles seriatim from said timing means into the pockets on the turret ahead of the bottle labelling station,

a second power-operated drive means engageable for actuating the feed drum, knife means and web advancing means in unison,

a means for operatively engaging and for disengaging said second drive means including an electrically-operated controller therefor,

a horizontal switch-actuating arm pivotally mounted and biased for movement into the path of the timed upright bottles passing the timing means and pivoted by contact with said timed bottles,

said arm being positioned for contacting said bottles a distance along the path therefor to the bottle labelling station that equals the distance in the mandrel path between the mandrel loading station and the bottle labelling station, and

an energizing circuit connected to said controller and including a switch operated by said arm in response to said bottle contact therewith for operatively engaging said second drive means, whereby labels are fed to the mandrels at the mandrel loading station only in response to said bottles contacting said arm.

4,108,706

LABELLING MACHINE

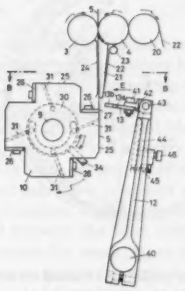
Jacobus Brands, Eindhoven, Netherlands, and Kurt Thaddey, Buchs, Switzerland, assignors to Prontophot Holding AG, Dubendorf, Switzerland

Filed May 26, 1977, Ser. No. 800,874

Claims priority, application Switzerland, Jun. 2, 1976, 6926/76

Int. Cl.[2] B65C *9/02, 9/18*

U.S. Cl. 156—384 8 Claims



1. In a labelling machine having a tape reel, a feed device comprising feed rollers for drawing tape from the reel and

feeding it to a cutting device, and means serving to transfer a label which comprises a cut length of the tape to an article which is to be labelled, the improvement comprising, a cyclically operable printing device for printing the tape and being arranged between the reel and the feed device, driving means for cyclically operating feed rollers of the feed device to draw a predetermined length of tape from the reel during each cycle of the machine, a transfer roller to which such a length of the tape is fed by the driving means, said transfer roller having a periphery with four flat areas each angularly displaced by 90° from an adjacent flat area, the periphery of said transfer roller being cut-back between adjacent flat areas to define a step, and four cutters each arranged in a respective one of the steps such that the cutting edge of each cutter is flush with the periphery of the transfer roller, said transfer roller being rotatable stepwise through angular steps of 90° such that in each rotary position of the transfer roller one of the flat areas and one cutting edge of the cutters lies in a common plane with the tape which has been fed by the feed rollers to the transfer roller, a pivotal arm and means for movably mounting a counter-cutter on the arm being arranged opposite to said one flat area and said one cutting edge, said arm being cyclically driven whereby said counter-cutter cooperates with a said cutter on the transfer roller to sever a length of tape and thereby defining a cutting station, the transfer roller having an internal hollow space being connected to a source of vacuum and having radially extending bores leading from the internal space to the flat peripheral areas for holding thereon by vacuum the severed length of tape, a station for transferring a label comprising the severed length of tape to an article which is to be labelled, said transfer roller feeding such length of tape by the cyclically operable transfer roller directly to said transfer station, said transfer station being arranged with respect to the rotary direction of the transfer roller across from the pivotal arm, and said transfer station comprising means for feeding an article to be labelled past the severed length of tape on the transfer roller, said feeding means serving to feed the article in an upright position parallel to the axis of the transfer roller so that the predetermined length of tape drawn from the reel and severed by the cutter and counter-cutter defines the height of the label on the article.

4,108,707

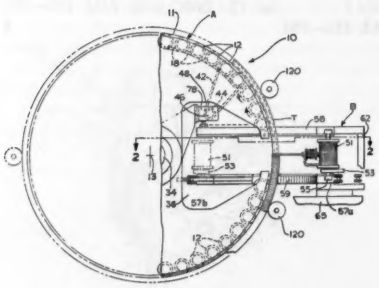
CLOSED TORUS TIRE

Paul E. Appleby, Cuyahoga Falls; Stanley J. Houck, Akron, and Richard B. Nash, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 646,716, Jan. 5, 1976, Pat. No. 4,052,237. This application May 27, 1977, Ser. No. 801,196

Int. Cl.[2] B29H *17/02, 17/14*

U.S. Cl. 156—397 **5 Claims**



1. An apparatus for building a closed torus tire comprising a rotatable center shaft, first cylindrical support means having a pair of axially spaced apart end plates fixed coaxially and co-rotatably on said shaft, a plurality of rolls mounted in closely spaced parallel cylindrical array coaxially of said shaft and supported rotatably on said end plates, belt means for effecting rotation of said rolls each about its own axis, bearing means mounting said shaft for rotation of said first cylindrical support means to wrap liner stock in sheet form therearound, brake means operable to prevent rotation of said rolls during rotation of said first cylindrical support means, said rolls each having a shoulder near each of its respective ends, the shoulders cooperating to provide seats axially outward respectively of said belt means which seats cooperate to hold the bead cores in coaxial spaced relation relative to said liner stock disposed about said cylindrical array of rolls, an axially extending opening open radially and axially outwardly of said first cylindrical support means, and cord winding means including an oval track frame having a first part and a second part, said first part being mounted in said opening radially inward of the periphery of said first cylindrical support means, said second part being mounted radially and axially outward of said first cylindrical support means, at least one of said parts being movable into a cord winding position in said opening and alternatively to a position out of said opening for allowing said first support means to rotate about its own axis.

4,108,708

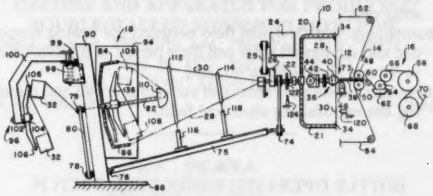
SCRIM MACHINE

Wallace D. Gregory, and James R. Moore, both of Inman, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 539,790, Jan. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 405,055, Oct. 10, 1973, abandoned. This application Jul. 1, 1977, Ser. No. 812,061

Int. Cl.[2] B32B *31/12*

U.S. Cl. 156—441 **5 Claims**



1. Apparatus for producing non-woven fabric comprising: means to drive said apparatus, yarn guide means including a first pair of yarn guides spaced from one another, creel means for supporting a plurality of yarn packages, a hollow shaft member rotably supported in said apparatus, a plurality of radially directed yarn guide arms connected to shaft member, means operably associated with said creel means to supply yarn from said creel means through said hollow shaft member to said raidally directed yarn guide arms and to wind the yarn about said pair of spaced yarn guides to form reaches of yarn therebetween, a control circuit connecting said drive means to a source of power, a first means in operative relationship with said apparatus to break the control circuit to said drive means, a second means scanning the yarn between said yarn guide means and said yarn guides to allow said first means to break said control circuit to stop said drive means when a yarn break is detected, a third means operably associated with said control circuit and actuated after each scan by said second means to energize said first means upon the detection of a yarn break by said second means and means for combining a sheet of yarns with the yarn reaches between said first pair of spaced yarn guides to form a non-woven fabric, said third means including a ferrous material operably associated with said rotatable yarn guide means, a magnetic sensing means, a first timer to reset the circuit to said drive means when said first timer has timed out, a time controlled switch in operative relationship with said first timer and a second timer activated by said magnetic sens-

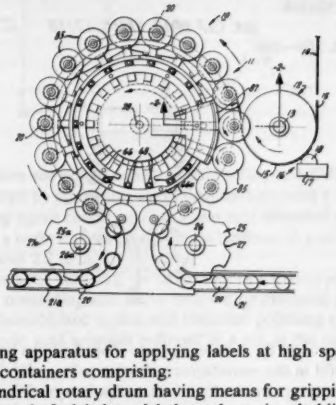
ing means to close the circuit to said first timer when said ferrous material is sensed by the magnetic sensing means.

4,108,709

LABEL APPLYING MACHINE

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Jun. 14, 1976, Ser. No. 695,805
Int. Cl.[2] B65C *3/12*
U.S. Cl. 156—446 **6 Claims**



1. Labeling apparatus for applying labels at high speed to cylindrical containers comprising:

(a) a cylindrical rotary drum having means for gripping the leading end of a label at a label supply station, holding the label on the cylindrical surface of the rotating drum, conveying the label so held to a label applying station and releasing the label to a container at such station,

(b) a container feed for supplying cylindrical containers in rapid succession and in closely spaced array to said label applying station and in tangent contact with the labels at such station, said container feed including means for positively gripping the opposite ends of each container but allowing the container to rotate about its cylinder axis and

(c) container rotating means for rotating each container about its cylinder axis just before and at the time of first contact of the container with the leading edge of a label and during the time that the label is being wrapped around the container, said rotating means acting to cause the leading edge of the label on the drum and the surface of the container tangent to the label to move in the same direction at the instant of contact of the leading edge of the label with the container.

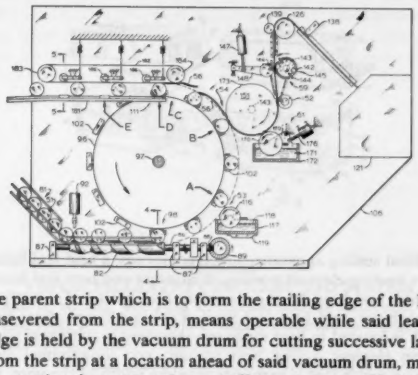
4,108,710

APPARATUS FOR APPLYING LABELS TO CONTAINERS

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Division of Ser. No. 226,064, Feb. 14, 1972, Pat. No. 3,834,963, which is a continuation-in-part of Ser. No. 5,187, Jan. 23, 1970, Pat. No. 3,765,991. This application Jun. 17, 1974, Ser. No. 480,044
Int. Cl.[2] B65C *9/04*
U.S. Cl. 156—450 **4 Claims**

1. Can labeling apparatus comprising a rotary mounted container drum having can gripping means at circumferentially spaced locations about the periphery for holding cans against rotation about the axes thereof, means rotating said container drum to thus move cans on the drum in a circular arc, a vacuum drum mounted for driven rotation about the axis thereof and disposed with the periphery thereof substantially tangent to the side of cans on said container drum as they move past the vacuum drum, said vacuum drum having peripheral openings controllably connected to a vacuum source for releasably holding can labels on the drum periphery as the vacuum drum rotates and also having a plurality of radial ridges thereacross spaced apart a predetermined distance circumferentially about the periphery of the drum to displace at least a portion of each label radially outward of the drum, such spacing being slightly greater than the length of the individual labels, an adhesive wheel for coating adhesive on each label while on a ridge, means for continuously feeding a parent strip of label material onto the periphery of the vacuum drum with its leading edge held by the vacuum drum and the portion of



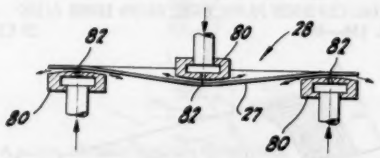
the parent strip which is to form the trailing edge of the label unsevered from the strip, means operable while said leading edge is held by the vacuum drum for cutting successive labels from the strip at a location ahead of said vacuum drum, means for rotating the vacuum drum to effect movement of individual labels cut from said strip to engage the adhesive wheel at said ridges and then to engage a can at the leading edge of the label, and means releasing successive cans from the container drum at a discharge station and rotating the released cans for wrapping a label about each can to secure the label about the can.

4,108,711

LABEL FEED

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Feb. 23, 1977, Ser. No. 771,327
Int. Cl.[2] B32B *31/00*; B26D *7/14*, *7/06*
U.S. Cl. 156—497 **1 Claim**



1. In a labeling machine for labeling containers comprising a container feed for supplying containers in sequence to a label applying station, a label feed comprising a label stock feed for continuously supplying a continuous label stock, a label cutting instrumentality for severing individual labels from the continuous label stock so delivered and a rotary label transfer means adapted to pick up each severed label on its surface and to supply the severed label to a container at the label applying station, the improvement which comprises label deforming means interposed between the label stock feed and the label cutting instrumentality for imparting to the label stock a concave-convex shape in transverse cross-section thereby stiffening the label stock and diminishing its tendency to bend in a longitudinal direction and to deviate from its intended path to the cutting instrumentality, said label deforming means being in the form of an air jet instrumentality acting on opposite sides

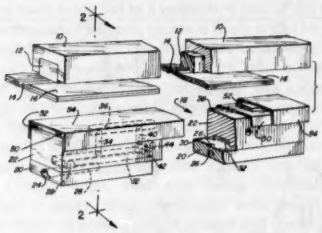
of the label stock to bend the stock along its longitudinal mid-portion to bow it longitudinally.

4,108,712

HEAT SEALING MACHINE WITH COOLING MEANS

Harry Bala, 2259 N. Kedzie, Chicago, Ill. 60647, and John C. Mowli, 2032 W. Jarvis, Chicago, Ill. 60645

Filed Feb. 22, 1977, Ser. No. 770,604
Int. Cl.[2] B30B *15/34*
U.S. Cl. 156—498 11 Claims



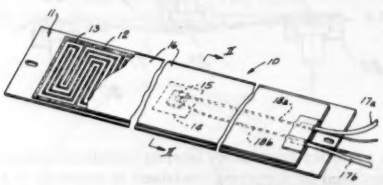
1. Heat sealing apparatus which comprises: a heat seal head; a wire heating element positioned adjacent said heat seal head; said heat seal head having a cooling fluid inlet and a cooling fluid exhaust; said heat seal head defining a longitudinal slot which is located in heat exchange relationship with said wire heating element during heat sealing, said longitudinal slot having a width that is narrower than the width of the wire, to provide wall supports on opposite sides of the wire; and a cooling fluid path coupling said cooling fluid inlet and the cooling fluid exhaust to said longitudinal slot, said cooling fluid exhaust being separate from but coupled to said longitudinal slot with said exhaust terminating away from said wire, whereby during heat sealing the cooling fluid can be circulated from the cooling fluid inlet to a heat exchange relationship with said wire and to the separate exhaust, enabling cooling fluid circulation during heat sealing.

4,108,713

LOW MASS ELECTRIC HEATER

Thomas Anthony Weisz, Wheeling, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Feb. 14, 1977, Ser. No. 768,267
Int. Cl.[2] B32B *31/00*; B42C *19/00*; H05B *1/100*
U.S. Cl. 156—499 20 Claims



7. A machine for rapid heating of a chemical adhesive used to connnect first and second objects together, comprising:

(a) a rapid heating, low mass electrical heater having

(i) a metal plate comprised of an element selected from the group consisting of magnesium and aluminum, said plate having a thickness of less than 0.1 inch,

(ii) an electrical insulating layer on one side of the metal plate,

(iii) a resistance type heating element arranged in a pattern on said insulating layer, and

(iv) a fast-acting temperature sensing means arranged adjacent said heating element; and

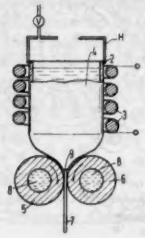
(b) means for positioning the first and second objects to be bound by the chemical adhesive such that the chemical adhesive is positioned adjacent said electrical heater for heat transfer to the adhesive.

4,108,714

PROCESS FOR PRODUCING PLATE-SHAPED SILICON BODIES FOR SOLAR CELLS

Wolfgang Keller, Munich, and Konrad Reuschel, Vaterstetten, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 20, 1976, Ser. No. 659,958
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1975, 2508369
Int. Cl.[2] B01J *17/16, 17/18*
U.S. Cl. 156—608 6 Claims



1. A process for producing plate-shaped silicon bodies which are useful in the manufacture of solar cells, comprising:

positioning a vertically orientated polycrystalline silicon rod on a plate having a slot-like aperture therein:

generating an annular melt zone about a portion of said rod which is in contact with said slot-like aperture:

controllably biasing said rod against said slot-like aperture so as to force a stream of molten silicon through said slot-like aperture and into a nip defined by spaced-apart rotating temperature controlled rollers positioned below and in registry with said slot-like aperture so that said nip receives the molten silicon stream and forges such stream into flat ribbon of a thickness corresponding to that of the desired plate-shaped bodies said rollers being maintained at a temperature sufficiently high so as to minimize thermal stress in the silicon; and

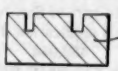
solidifying said ribbon as it travels beyond said nip.

4,108,715

METHOD FOR MACHINING SURFACES OF SEMICONDUCTOR SUBSTRATES

Kiyotsugu Ishikawa, and Kunio Itoh, both of Takatsuki, Japan, assignors to Matsushita Electronics Corporation, Japan

Filed Apr. 14, 1977, Ser. No. 787,427
Claims priority, application Japan, Apr. 20, 1976, 51-45100
Int. Cl.[2] H01L *21/312*
U.S. Cl. 156—628 3 Claims



1. A method for machining the surface of a gallium arsenide crystalline semiconductor substrate, comprising the steps of:

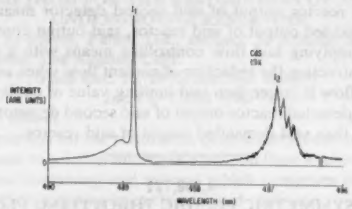
selectively doping a portion of said substrate surface with aluminum ions to change said surface portion from crystalline gallium arsenide to crystalline gallium aluminum arsenide; and

selectively etching said substrate surface to remove only the gallium arsenide or the gallium aluminum arsenide portion thereof.

4,108,716
POLISHING OF CdS CRYSTALS

Assunta Anna Pritchard, Brielle, and Sigurd Wagner, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1976, Ser. No. 752,899
Int. Cl.² C09K *13/04*
U.S. Cl. 156—636 **4 Claims**



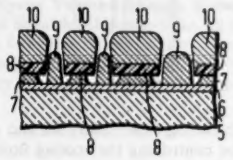
1. A process for polishing the cadmium face of a CdS crystalline material by contacting said cadmium face with a chemical polishing agent characterized in that said chemical polishing agent is a hydrochloric acid solution buffered to a pH in the range of about 2.2 to 2.8.

3. A process for polishing the sulfur face of a CdS crystalline material by contacting said sulfur face with a chemical polishing agent characterized in that said chemical polishing agent is a hydrochloric acid solution buffered to a pH in the range of about 0.7 to 1.3.

4,108,717
PROCESS FOR THE PRODUCTION OF FINE STRUCTURES CONSISTING OF A VAPOR-DEPOSITED MATERIAL ON A BASE

Dietrich Widmann, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 8, 1975, Ser. No. 594,046
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1974, 2432719
Int. Cl.² B05D *5/12*
U.S. Cl. 156—656 **4 Claims**



1. A process for producing a fine structure of an order of magnitude of 1 μm of a material on a surface of a base comprising the steps of:

providing a base with an auxiliary layer forming a surface, said layer consisting of a metal or metal alloy and having a thickness which may be considerably less than the thickness of the fine structure to be formed;

providing a mask on the surface of the base, said mask having openings corresponding to the fine structure of material to be applied on the surface of the base;

providing an etching agent which attacks the auxiliary layer but does not attack the mask;

etching the exposed portions of the auxiliary layer to a depth at which they are etched entirely away and an undercetching of a predetermined width exists beneath the edges of the mask;

depositing a layer of material over the entire surface with the step of depositing the material being by evaporation or sputtering;

controlling the amount of depositing so that the layer of material being deposited on the mask and the etched surfaces of the base has a thickness at least as large as said depth and less than a thickness which is necessary for the material deposited on the etched surface to contact the material deposited on the mask;

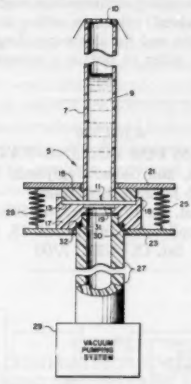
subsequently removing the mask with the layer of material deposited thereon; and then

entirely etching away the remaining portions of the auxiliary layer without substantially etching the fine structure.

4,108,718
VAPOR FILTRATION PROCESS AND SYSTEM

Frank A. Rickey, Jr.; Paul C. Simms, both of Lafayette, Ind., and Neal R. Butler, Acton, Mass., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Jan. 27, 1976, Ser. No. 652,831
Int. Cl.² B01D *1/00*
U.S. Cl. 159—30 **2 Claims**



1. A vapor filtration system, comprising:

a container for receiving water having dissolved materials therein;

a thin film having one side in contact with said water in said container, said thin film passing water vapor but blocking passage of water and solids therein;

supporting means for maintaining the relative positioning between said thin film and said container, said supporting means including spring biased clamping means and a porous support engaging said thin film at the other side of said thin film; and

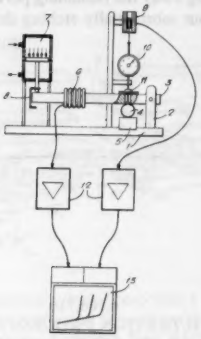
vacuum supply means providing a pressure differential at the other side of said thin film with water in contact with said thin film being caused to be changed to water vapor and dissolved materials in said water solidified when said water vapor is formed, said solid materials being collected on said thin film as said water vapor passes through said thin film.

4,108,719

METHOD AND APPARATUS FOR GAUGING THE RADIAL SPACING BETWEEN FUEL AND SURROUNDING CLADDING OF A FUEL ROD FOR NUCLEAR REACTORS

Kai D. Olshausen, Raelingen, Norway, assignor to Institutt for Atomenergi, Kjeller, Norway

Filed Feb. 7, 1977, Ser. No. 766,003
Claims priority, application Norway, Feb. 12, 1976, 760446
Int. Cl.[2] G21C 17/06
U.S. Cl. 176—19 R 4 Claims



1. Method for gauging the radial spacing between fuel and surrounding cladding of a fuel rod for a nuclear reactor comprising the steps

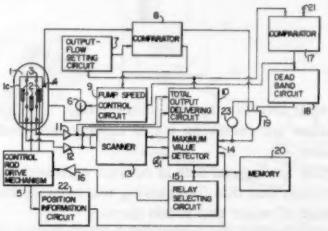
squeezing said cladding until contact is formed with the internal fuel, repeatedly measuring the squeezing force and the corresponding deformation, and correlating the respective measured values in order to determine said contact formation and the corresponding deformation of the cladding in order to obtain a measure of said radial spacing.

4,108,720

CONTROL SYSTEM FOR BOILING-WATER REACTOR

Takao Sato, Ibaraki, and Sakae Sugiyama, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 11, 1975, Ser. No. 595,330
Claims priority, application Japan, Jul. 15, 1974, 49-80127
Int. Cl.[2] G21C 7/00
U.S. Cl. 176—20 R 13 Claims



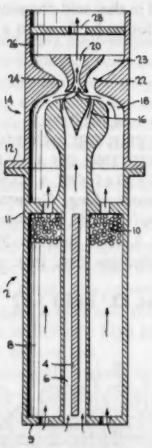
1. A system for controlling the output of a boiling-water reactor comprising a reactor core, flow controlling means for controlling the flow of coolant through said reactor core, first detector means for detecting said actual coolant flow and providing an output indicative thereof, second detector means for detecting the output of said reactor and providing an output indicative thereof, and an output controlling means responsive to the outputs of said first and second detector means and a demanded output of said reactor for applying an output control signal to said flow controlling means, said output controlling means including first means responsive to the output of said second detector means for outputting as a limiting value of coolant flow a signal representing a zero coolant flow when said output of said second detector means is smaller than a predetermined reactor output and representing a larger coolant flow with the increase of the output of said second detector means when the output of said second detector means is larger than said predetermined reactor output, second means for comparing the output of said first means with the output of said first detector means, and a third means for comparing said detected reactor output of said second detector means with said demanded output of said reactor, said output controlling means supplying said flow controlling means with a control signal instructing the reduction of coolant flow when an actual coolant flow is larger than said limiting value of coolant flow and said detected reactor output of said second detector means is larger than said demanded output of said reactor.

4,108,721

AXISYMMETRIC FLUIDIC THROTTLING FLOW CONTROLLER

Tadeusz M. Drzewiecki, Silver Spring, and Francis M. Manion, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 14, 1977, Ser. No. 806,438
Int. Cl.[2] G21C 7/16
U.S. Cl. 176—36 R 8 Claims



1. A fluidic throttling flow controller and nuclear reactor core assembly for controlling the cooling flow from first and second core cooling passages in a nuclear reactor wherein a poison material located in said first passage is movable by means of coolant flow between a reactor shutdown position and a non-shutdown position, said posion material being movable to said shutdown position when a substantially reduced flow occurs in said first passage,

a fluid amplifier including a main jet supplied by said first passage, a control jet supplied by said second passage, a central output, a tangential output, and means to switch flow from said central output to said tangential output when the temperature of the flow through said second passage exceeds a desired switching value; and

a vortex valve including a vortex chamber having a central inlet connected to receive fluid from said central output of said fluid amplifier, tangential control ports connected to receive fluid from said tangential output and produce vortex flow in said vortex chamber when the flow from said fluid amplifier is switched to said tangential output, and a vortex drain;

whereby flow through said flow controller and core assembly is substantially reduced when the temperature of the flow through said second passage exceeds said desired value, and said poison material thereby falls to said shut-down position.

4,108,722

METHOD FOR THE RESTORATION OF AN UNDERGROUND RESERVOIR

Dennis E. Stover, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1976, Ser. No. 749,597
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—1 **6 Claims**

1. A method for the restoration of an underground reservoir subsequent to solution mining of a mineral from a subterranean formation containing said mineral which comprises introducing a sulfate reducing bacteria into said reservoir.

4,108,723

METHOD FOR OPTICAL RESOLUTION OF DL-LYSINE COMPOUNDS

Hideo Hirohara; Shigeyasu Nabeshima, both of Ibaraki, and Tsuneyuki Nagase, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 1, 1977, Ser. No. 829,945
Claims priority, application Japan, Sep. 8, 1976, 51-108277
Int. Cl.[2] C07B *19/02*
U.S. Cl. 195—2 **20 Claims**

1. A method for producing L-lysine or acidaddition salts thereof from DL-lysine alkyl ester or acid-addition salts thereof, which comprises contacting under a weakly acidic condition an aqueous solution of the DL-lysine alkyl ester or acid-addition salts thereof with a non-specific protease having ability to resolve the DL-lysine alkyl ester or acid-addition salts thereof and being produced by bacteria belonging to the genus Streptomyces and recovering L-lysine or acid-addition salts thereof thus produced.

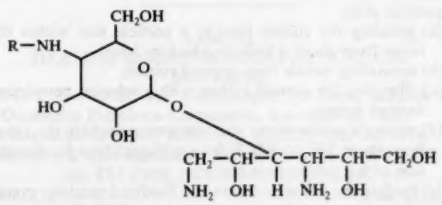
4,108,724

METHOD FOR PREPARING ANTIBIOTIC P-2563 USING *PSEUDOMONAS FLUORESCENS*

Kiyoshi Nara, Kyoto; Yasuhiro Sumino, Kobe; Mitsuko Asai, Takatsuki, and Shunichi Akiyama, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Apr. 7, 1976, Ser. No. 674,310
Claims priority, application United Kingdom, Apr. 11, 1975, 15062/75
Int. Cl.[2] C12D *9/20*
U.S. Cl. 195—96 **5 Claims**

1. A method for producing antibiotic P-2563 having the formula:



wherein R represents hydrogen or an acyl group, which comprises: cultivating a strain of *Pseudomonas fluorescens* P-2563 (ATCC-31125) in a culture medium contaning assimilable and digestable nitrogen sources until said antibiotic is substantially accumulated therein and recovering the thus accumulated antibiotic.

4,108,725

ANTIBIOTIC COMPLEX

Hiroshi Kawaguchi, Tokyo; Koji Tomita, Kawasaki; Kei-ichi Fujisawa, Kamifukuoka, and Hiroshi Tsukiura, Mitaka, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 627,391, Oct. 30, 1975, Pat. No. 4,012,576, which is a continuation-in-part of Ser. No. 532,137, Dec. 12, 1974, abandoned. This application Aug. 13, 1976, Ser. No. 714,202
Int. Cl.[2] C12D *9/20*
U.S. Cl. 195—96 **3 Claims**

1. A process for producing the antibiotic complex Bu-2183 which comprises cultivating Pseudomonas sp. strain D946-B83, A.T.C.C. 31086, in an aqueous nutrient medium containing assimilable sources of nitrogen and carbon under submerged aerobic conditions until a substantial amount of Bu-2183 is produced by said organism in said culture medium.

4,108,726

SARCOIDOSIS TEST

Emanuel Silverstein, Brooklyn, N.Y., assignor to Research Corporation, New York, N.Y.

Filed Jul. 15, 1976, Ser. No. 705,432
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—103.5 R **8 Claims**

1. A method for determining angiotensin converting enzyme in untreated human serum which comprises admixing said serum to be tested for angiotension converting enzyme with a substrate to yield L-histidyl-L-leucine in the presence of angiotension converting enzyme, said substrate being selected from the group consisting of angiotensin I and hippuryl-L-histidyl-L-leucine, said substrate being added until said serum comprises about 4% by volume of the admixture thereof with said substrate, adding o-phthaldialdehyde to the resulting admixture in the form of about a 2% solution thereof in an amount such that the concentration thereof is about 0.11% by weight thereof, thereby forming the fluorescent adduct of o-phthaldialdehyde and the resulting produced L-histidyl-L-leucine and spectrofluorimetrically determining the amount of said fluorescent adduct.

4,108,727

METHOD, COMPOSITION AND DEVICE FOR DETERMINING THE SPECIFIC GRAVITY OR OSMOLALITY OF A LIQUID

Sisto Nicholas Stiso, Elkhart, Ind., and Chester L. Sutula, Annandale, N.J., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 23, 1976, Ser. No. 716,962
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—103.5 R **35 Claims**

1. A method for determining the specific gravity or osmolality of a liquid containing a nonionic, ionizable solute, said method comprising

contacting the liquid with an ionizing agent capable of ionizing said nonionic solute therein, and a test means capable, upon contact with a liquid containing said solute in ionized form, of producing a detectable response which is a function of the specific gravity or osmolality of such liquid, and

subsequently determining the specific gravity or osmolality of the liquid by detecting the response produced by the test means.

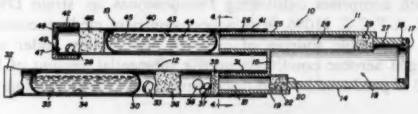
4,108,728
ANAEROBIC LIQUID TRANSPORT APPARATUS

Ernest Elliott Spinner, Grandview; Lowell Donald Miller; Phyllis Eleanor Riely, both of Kansas City, all of Mo.; Carl Fredrick Avery, Jr., Rockford, Ill.; Melvin Wayne Hounsell, Beloit, Wis., and Ben Bruce Howard, Rockford, Ill., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 690,528, May 27, 1976, abandoned. This application Jul. 28, 1976, Ser. No. 709,431

Int. Cl.[2] C12K *1/04;* **B01J** *7/00*

U.S. Cl. 195—127 **18 Claims**



1. An anaerobic liquid storage and transport apparatus comprising:

a liquid receiver means for receiving and holding an anaerobic liquid;

a gas generator container means containing a gas generator for generating a reducing gas;

the gas generator comprising a reducing gas generating solid material, an ampoule containing a liquid which is reactive with the solid material to produce a reducing gas catalytically reactive with oxygen at room temperature, and means in the container means which prevents liquid from flowing from the container means after the ampoule is opened but which permits flow of reducing gas out of the container means;

first means for supplying reducing gas from the gas generator container means to the liquid receiver means, and second means other than said first means for exit of the reducing gas out of the liquid receiver means without flow of liquid therefrom; and

a catalyst positioned to promote reaction between the reducing gas, when produced by the gas generator, and oxygen to thereby produce an anaerobic environment in contact with a liquid placed in the liquid receiver means.

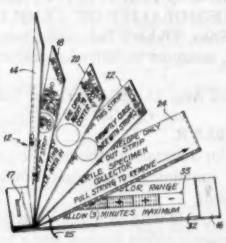
4,108,729
PAPER BOOKLET FOR PRESUMPTIVE DIAGNOSIS OF NEISSERIA GONORRHOEAE IN THE MALE

Frederick C. Mennen, La Porte, Ind., assignor to U.S. Packaging Corp., La Porte, Ind.

Filed May 16, 1977, Ser. No. 797,467

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—127 **3 Claims**



1. A booklet for presumptive diagnosis of Neisseria Gonorrhoeae in the male consisting essentially of four staggered strips, (a) through (d), of bibulous iron-free absorptive material in overlying relation with (a) through (d) lying back to front in the booklet;

strip (a) being a bibulous collector strip having a target circle between its ends for collecting a sample of exudate from the meatus of a male penis in the target circle;

strip (b) overlying strip (a) being a reactor strip consisting of bibulous material impregnated with a chromogen reagent and being substantially color free;

strip (c) overlying strip (b) being a bibulous wettor strip having a wettor target circle overlying said target circle of said collector strip whereby one or two drops of physiological saline applied to the wettor target circle passes through strip (b) to carry chromogen reagent wet with said one or two drops into the target circle of said collector strip to create a color change on the back side of said strip (a) in the presence of Neisseria Gonnorrhoeae in the exudate applied to strip (a);

strip (d) overlying strip (c) consisting of polymer coated material serving to press the one or two drops of physiological saline through (c), (b) and (a);

a gradient color scale range strip located beneath strip (a) whereby subsequent to sampling and pressing, strip (a) can be lifted to achieve an open book effect to view the color change on the back of strip (a) against said gradient color scale range; and

said chromogen reagent selected from the group consisting essentially of p-amino dimethylaniline oxalate, N, N-dimethyl-p-phenylenediamine dihydrochloride, N, N-dimethyl-p-phenylenediamine oxalate, N, N-dimethyl-p-phenylenediamine monohydrochloride and N. N. N′ N′ tetra-methyl-p-phenylenediamine dihydrochloride.

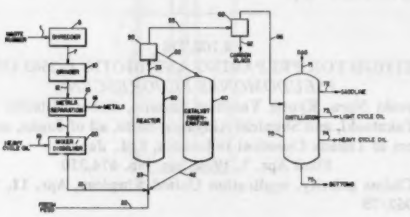
4,108,730
METHOD FOR TREATMENT OF RUBBER AND PLASTIC WASTES

Nai Yuen Chen, Titusville, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,509

Int. Cl.[2] C10B *47/24, 53/02, 55/10*

U.S. Cl. 201—2.5 **5 Claims**



1. A process for converting rubber from tires to distillates including a gasoline fraction which comprises the following sequential steps:

(a) grinding the rubber tires to a particle size within the range from about ¼-inch to ⅛-inch or less;

(b) separating metals from ground rubber;

(c) slurrying the ground rubber with a selected petroleum-derived stream;

(d) maintaining the slurry at a temperature within the range from about 500° to 700° F for a sufficient time for dissolution of the rubber to occur;

(e) feeding the rubber solution to a fluidized catalytic cracking zone operated at a temperature of 850° F or more, a pressure from subatmospheric to 3 atmospheres, and in the absence of externally added hydrogen;

(f) withdrawing a cracked product having a liquid hydrocarbon component and a solids component;

(g) separating the solids component from the liquid hydrocarbon component, and

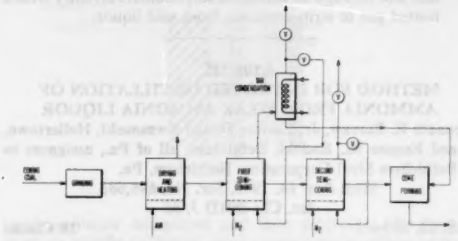
(h) distilling the liquid hydrocarbon component to recover distillates including a gasoline fraction.

4,108,731

COKE PRODUCTION

Luigi Palumbo; Angelo Colletta, and Giampaolo Giromella, all of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Continuation of Ser. No. 528,393, Nov. 29, 1974, abandoned. This application Oct. 18, 1976, Ser. No. 733,176
Claims priority, application Italy, Nov. 29, 1973, 53985 A/73
Int. Cl.[2] C10B *47/24, 49/10, 53/04, 57/02*
U.S. Cl. 201—8 **1 Claim**



1. In a method of producing coke, comprising grinding coking coal containing about 0.64% by weight sulfur, drying and heating the ground coal at a temperature of 200° to 300° C. for 15 to 120 minutes by fluidizing the ground coal with gas consisting essentially of 50 to 100% by volume air, 0 to 50% by volume steam and 0 to 50% by volume nitrogen in addition to that present in said air thereby to produce a dried and heated material; passing said material to a first semicoking stage, heating said material by fluidization in said first semicoking stage at 400° to 600° C. for 10 to 60 minutes while supplying to said first semicoking stage a make-up fluidizing gas comprising 0 to 20% by volume air, 50 to 100% by volume nitrogen in addition to that present in said air, and 0 to 50% by volume steam, thereby to produce semicoke and offgases; cooling said offgases to produce condensed tar and residual gases; passing the semicoke from said first semicoking stage to a second semicoking stage, heating the semicoke by fluidization in said second semicoking stage at 800° to 1,100° C. for 10 to 60 minutes with the production of offgases while supplying to said second semicoking stage a make-up fluidizing gas comprising 0 to 70% by volume air and 30 to 100% by volume nitrogen in addition to that present in said air; and briquetting the semicoke from said second semicoking stage into formed coke; the improvement comprising substantially reducing the residual sulfur content of the formed coke to about 0.4% by weight by recycling to said first semicoking stage at fluidizing gas 15 to 95% by volume of said residual gases; and recycling to said second semicoking stage as fluidizing gas 15 to 95% by volume of said offgases from said second semicoking stage.

4,108,732

HEATING CARBONACEOUS PARTICULATE MATERIAL

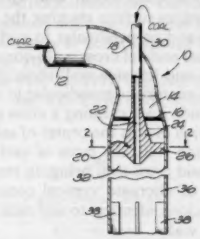
Herbert E. Nuttall, Jr., Albuquerque, N. Mex., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 473,125, May 24, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,208
Int. Cl.[2] C10B *1/04, 49/06, 49/12, 49/20*
U.S. Cl. 201—22 **29 Claims**

1. A process for subjecting carbonaceous particulate material to the influence of a stream comprising a heat-supplying particulate material comprising:

a. forming a primary swirling annular stream, substantially free of free oxygen by preventing free oxygen from being mixed with said stream during the formation of said stream, said stream comprising an entrained heat-supplying primary particulate material, said primary swirling annular stream having a central cavity;

b. introducing into said central cavity of secondary stream comprising a fresh carbonaceous particulate material, substantially free of free oxygen by preventing free oxygen from being mixed with said stream prior to and during introduction into said central cavity, said fresh carbonaceous particulate material having an initial chemical composition;



c. subjecting said fresh carbonaceous particulate material to the influence of said heat-supplying primary particulate material thereby causing a transformation of said fresh carbonaceous particulate material into a substance of different chemical composition than said initial chemical composition, said substance comprising a solid product, and preventing free oxygen from being introduced into said reactor; and

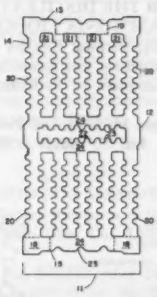
d. removing all material from said reactor.

4,108,733

HIGH EFFICIENCY COKE OVEN REGENERATOR CHECKER BRICK

Donald Joel Gerber, Glenshaw, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 25, 1977, Ser. No. 790,667
Int. Cl.[2] C10B *29/02;* **F23L** *15/02*
U.S. Cl. 202—267 A **8 Claims**



1. A high efficiency coke oven regenerator checker brick, composed of refractory material, comprising:

a. a vertical front side wall, the external face of which is formed of an alternate vertical concave radii, the radius of which is greater than ½ inch, and flat surface configuration symetrically positioned about the center of said wall;

b. a vertical right side wall, projecting rearward from the right edge of said front side wall at a 90° angle, the external face of which is formed of a set of alternate vertical concave and convex radii configurations, the radius of which is not less than ½ inch, centrally divided by a vertical flat separator surface, with the internal face formed by the opposite relief of the external face;

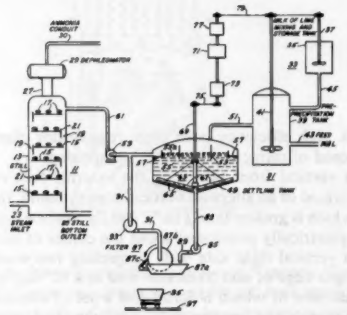
c. a vertical rear side wall, projecting to the left from the rear edge of said right wall at a 90° angle and running parallel to said front side wall, the external face of which is identical to that of said front side wall;
d. a vertical left side wall forming a connection between the left edges of said rear side wall and said front side wall, projecting from each at a 90° angle, the external and internal faces of said left side wall being identical to those of said right side wall;
e. a horizontal top surface abutting the top edges of said side walls and perpendicular to said side walls;
f. a horizontal bottom surface abutting the bottom edges of said side walls and perpendicular to said side walls;
g. a pair of vertical parallel cross walls connecting said right side wall with said left side wall about the mid points of said side walls, running perpendicular to said left side wall and said right side wall, creating a cross slot between said cross walls which bisects the center of said right side wall and said left side wall, the faces of said cross walls, exposed within said cross slot, being, in respective opposite relief, formed of alternate vertical concave and convex radii configurations, identical to said radii configuration of said right side wall;
h. a plurality of vertical front separator walls running parallel to and between said right side wall and said left side wall, connecting said front side wall to the foremost of said cross walls, said separator walls forming, with themselves and with the internal faces of said right side wall and said left side wall, slots, identical in size and configuration to said slot formed by said faces of said cross walls;
i. a plurality of vertical rear separator walls running parallel to and between said right side wall and said left side wall, connecting said rear side wall to the rearmost of said cross walls, said separator walls forming, with themselves and with the internal faces of said right side wall and said left side wall, slots, identical in size and configuration to said slot formed by said faces of said cross walls;
j. means, fixed to said checker brick, for elevating said checker brick above an object upon which said checker brick is placed, allowing a horizontal open space between said checker brick and said object upon which said checker brick is placed.

4,108,734

PROCESS FOR THE DISTILLATION OF WEAK AMMONIA LIQUOR

Daniel Kwasnoski, Hellertown; Charles J. Sterner; Russel J. Horst, both of Bethlehem, and Kenneth R. Burcaw, Jr., Easton, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jun. 14, 1976, Ser. No. 695,624
Int. Cl.[2] B01D *3/38*
U.S. Cl. 203—7 **13 Claims**



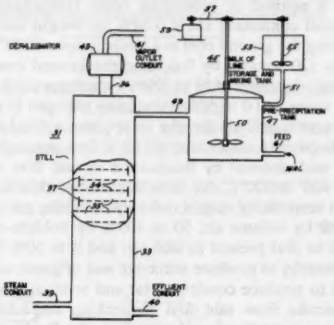
1. An improved method of removing both free and fixed ammonia from weak ammonia liquor derived from a coal coking operation while reducing calcium solids accumulation in the still apparatus comprising:
(a) premixing ammonia liquor which contains both substantial free ammonia as ammonium carbonate, ammonium sulfide and ammonium cyanide and fixed ammonia as ammonium chloride, ammonium thiocyanate and ammonium sulfate, prior to initiating any removal of said ammonia by distillation, with lime to pre-precipitate lime compounds from the undistilled liquor,
(b) clarifying the weak ammonia liquor by removing substantially all precipitated lime compounds and undissolved lime from the undistilled liquor, and
(c) passing the pre-precipitated and clarified ammonia liquor into and through an ammonia still countercurrently with a heated gas to strip ammonia from said liquor.

4,108,735

METHOD FOR IMPROVED DISTILLATION OF AMMONIA FROM WEAK AMMONIA LIQUOR

Kenneth R. Burcaw, Jr, Easton; Daniel Kwasnoski, Hellertown, and Eugene M. Rudzki, Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jun. 14, 1976, Ser. No. 695,685
Int. Cl.[2] B01D *3/38*
U.S. Cl. 203—7 **18 Claims**



1. An improved method of distilling weak ammonia liquor containing both free and fixed ammonia derived from a coal coking operation with decreased fouling of the still apparatus comprising:
(a) premixing ammonia liquor which contains both substantial free ammonia as ammonium carbonate, ammonium sulfide and ammonium cyanide and fixed ammonia as ammonium chloride, ammonium thiocyanate and ammonium sulfate prior to initiating any distillation with sufficient lime to pre-precipitate at least most of the principal components of precipitation fouling from the undistilled weak ammonia liquor, and
(b) passing the ammonia liquor subsequent to pre-precipitation with said lime through an ammonia still countercurrently with steam to distill the ammonia liquor and release ammonia from the liquor.

4,108,736

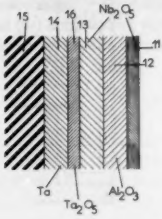
METHOD OF PRODUCING PROTECTIVE COATINGS

Serge Rigo, Drancy, and Julius Siejka, Paris, both of France, assignors to Agence Nationale de Valorisation de la Recherche (Anvar), Neuilly-sur-Seine, France

Filed Nov. 25, 1974, Ser. No. 526,915
Claims priority, application France, Nov. 23, 1973, 73 41847; Jul. 26, 1974, 74 26017
Int. Cl.[2] C25D *11/04, 11/26, 11/28, 11/32*
U.S. Cl. 204—1.5 **24 Claims**

1. The method of providing a metallic part susceptible to

corrosion with a corrosion-resistant coating, which comprises depositing onto said metallic part a surface layer of a first material selected from the group of materials consisting of niobium, chromium, tungsten and molybdenum in the metallic state or of a conducting compound or alloy containing said first material, depositing on said surface layer, a top layer of a second metal material different from said first material and selected from the group consisting of aluminum, silicon, gallium, tantalum, uranium and molybdenum, either in the metallic state if it forms itself a semi-conductive or an insulator, or combined or alloyed with at least one other element to form a



semi-conductor compound and then subjecting the surface layer to anodic oxidation, thus causing metal of the surface layer to migrate through and onto the metal of the top layer, and forming thereon a coating of an oxide of the one of the metals of the surface layer, and interrupting the anodic oxidation prior to the complete oxidation of the first element of the surface layer, whereby there is formed on the three-layer corrosion-resistant coating of an oxide of the metal of the surface layer, subjacent the top layer, metal of the surface layer still being in the metallic state, the top layer in an oxidized state and an oxide of the metal of the surface layer overlying the top layer.

4,108,737

METHOD OF CONTINUOUS PRODUCTION OF A DUCTILE SUPERCONDUCTING MATERIAL IN THE FORM OF TAPES, FOILS OR WIRES

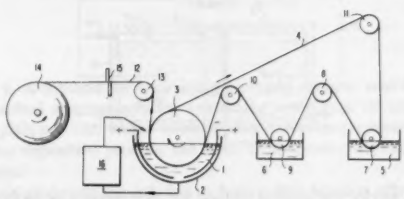
Josef Ehrhardt, Wiesbaden, and Heinrich Winter, Eschborn, both of Germany, assignors to Battelle-Institute, Postfach, Germany

Filed Mar. 29, 1977, Ser. No. 782,381

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1976, 2613285

Int. Cl.[2] C25D *1/04, 15/00, 15/02*

U.S. Cl. 204—13 **20 Claims**



1. A method for the continuous production of ductile, superconducting material in the form of tapes, foils or wires comprising the steps of:

(a) preparing submicron particles of a superconducting material, said particles having diameters of between 50 and 2000 A;

(b) suspending said submicron particles in an electrolyte solution containing a wetting agent;

(c) codepositing said submicron superconducting particles and a matrix metal onto a moving substrate by galvanic action;

(d) alternately depositing at least one layer of matrix material having submicron particles dispersed therein and at least one layer of metal onto said deposit;

(e) reducing the cross-sectional dimensions of said deposit; and

(f) applying a coating thereto to isolate the superconducting layers.

4,108,738

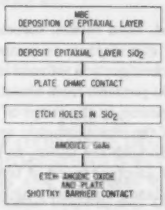
METHOD FOR FORMING CONTACTS TO SEMICONDUCTOR DEVICES

Alfred Yi Cho, Summit, and Martin Victor Schneider, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 18, 1977, Ser. No. 770,014

Int. Cl.[2] C25D *5/02, 7/12*

U.S. Cl. 204—15 **11 Claims**


DEPOSITION OF EPITAXIAL LAYER
DEPOSIT EPITAXIAL LAYER SiO_2
PLATE OHMIC CONTACT
ETCH HOLES IN SiO_2
ETCH ANODIC OXIDE AND PLATE SHOTTKY BARRIER CONTACT

1. A process for fabricating a Schottky barrier device comprising the steps of:

(a) forming a semiconductor epitaxial layer on a major surface of a semiconductor substrate;

(b) forming an ohmic contact on an opposite major surface of said substrate;

(c) forming a mask on the free surface of said epitaxial layer so as to have an opening which exposes a portion of said free surface;

(d) converting said epitaxial layer in the opening to a stable oxide so as to form a depression in said epitaxial layer filled with said oxide;

(e) leaving said oxide in said depression until step (f) so as to protect said epitaxial layer in said opening from contamination by the atmosphere; and

(f) subjecting the body formed by steps (a) to (e) to a plating solution so that (1) said oxide is removed and said depression in said epitaxial layer is exposed to said solution and, (2) substantially immediately thereafter a metal is deposited in said depression, thereby forming a Schottky barrier contact with said epitaxial layer.

4,108,739

PLATING METHOD FOR MEMORY ELEMENTS

Eiichi Tadokoro, and Tatsuji Kitamoto, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Continuation of Ser. No. 579,162, May 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 503,205, Sep. 4, 1974, abandoned. This application Apr. 12, 1977, Ser. No. 786,926

Claims priority, application Japan, Sep. 4, 1973, 48-99641

Int. Cl.[2] C25D *3/56, 5/10, 5/14*

U.S. Cl. 204—40 **4 Claims**

1. A method for electroplating in a single electroplating bath which contains nickel and cobalt as the main component and as an additional component phosphorus, said components being either ferromagnetic or non-magnetic in properties, said electroplating bath containing from about 1 to 300 g/l of nickel ions, from about 1 to 300 g/l of cobalt ions and from about 1 to 100 g/l of $NaH_2PO_2.H\,O$, said method comprising varying the electric current density during plating from about 0.3A/dm^2 to about 10A/dm^2 so that a non-magnetic film is selectively deposited at one electric current density and a ferromagnetic film

is selectively deposited at a second electric current density, thereby forming a plated non-magnetic film containing mainly nickel and cobalt and as an additional component phosphorus and a plated ferromagnetic film, said ferromagnetic and non-magnetic components being selectively deposited at different electric current densities.

4,108,740

HARD, HEAT-RESISTANT NICKEL ELECTRODEPOSITS

William Ronald Wearmouth, Halesowen, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed May 25, 1977, Ser. No. 800,579

Claims priority, application United Kingdom, May 28, 1976, 22299/76

Int. Cl.² C25D *3/12, 1/02, 1/08*

U.S. Cl. 204—11 **19 Claims**

1. An electroformed, hard nickel, screen printing cylinder for exposure in use or manufacture to temperatures exceeding 200° C, said hard nickel portion of said cylinder consisting essentially of, in weight percent: from about 0.007 to about 1% sulfur, sufficient manganese, in the range of from about 0.02 to about 5%, in excess of the stoichiometric amount necessary to form manganese sulfide with the sulfur, to improve embrittlement resistance of said electrodeposit at temperatures exceeding 200° C; and the balance essentially nickel.

4,108,741

PROCESS FOR PRODUCTION OF ALUMINUM

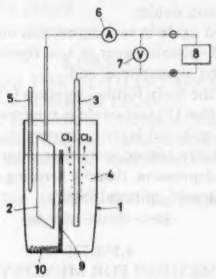
Yoshishige Tsumura, Tokyo, Japan, assignor to Mitsui Aluminum Co., Ltd., Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,457

Claims priority, application Japan, May 26, 1976, 51-59953

Int. Cl.² C25C *3/06*

U.S. Cl. 204—67 **6 Claims**



1. A process for the production of aluminum, which comprises the steps of introducing into an electrolytic cell an electrolytic bath containing 50 to 93% by weight of aluminum chloride and additionally incorporating therein 0.1 to 3% by weight, based on the weight of the bath, of at least one member selected from the group consisting of magnesium salts and calcium salts; electrolyzing said electrolytic bath under conditions of a current density for the anode in the range of from 0.5 A/dm² to 200 A/dm², a current density for the cathode in the range of from 0.5 A/dm² to 200 A/dm², a bath temperature in the range of from 120° C to 250° C and a cell voltage in the range of from 2.7 V to 11.4 V, thereby educing aluminum on the cathode; causing the educed aluminum to come off the cathode and form a precipitate in said electrolytic bath; separating said precipitate from said electrolytic bath; melting said separated precipitate to give rise to an aluminum phase and a fusion slag phase; and isolating said aluminum phase.

4,108,742

ELECTROLYSIS

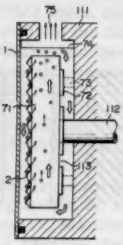
Maomi Seko, Tokyo; Shinsaku Ogawa, and Muneo Yoshida, both of Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 556,484, Mar. 7, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 771,978

Claims priority, application Japan, Mar. 9, 1974, 49-26775

Int. Cl.² C25B *1/16, 1/26*

U.S. Cl. 204—98 **8 Claims**



1. A process for the electrolysis of an aqueous alkali chloride solution in a bipolar electrolytic cell, the cell being partitioned by a cation exchange membrane into cathode and anode chambers, the cathode and anode being formed of gas permeable metallic plates, said process comprising conducting electrolysis while generating chlorine gas at the anode and hydrogen gas at the cathode and discharging said gases in back of the respective electrodes while controlling the pressure in the cathode chamber so that it is higher than the pressure in the anode chamber, thereby to press the cation exchange membrane towards but not against the anode so that the width of the desalted layer between the membrane and the anode is reduced to a minimum.

4,108,743

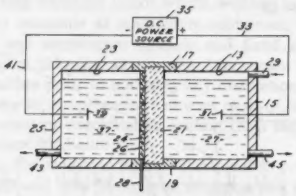
METHOD AND APPARATUS FOR SEPARATING A METAL FROM A SALT THEREOF

Robert W. Minck, Lathrup Village, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 2, 1977, Ser. No. 793,105

Int. Cl.² C25C *3/00*

U.S. Cl. 204—64 R **43 Claims**



1. In an electrochemical method for recovering a metal from an electrically dissociable salt thereof, which comprises: placing said salt in a molten state in contact with one side of a solid electrolyte that is impermeable to said metal, said salt and the anions of said salt, and selectively conductive with respect to the cations of said metal and said salt; providing a first electrode in contact with said salt on one side of said solid electrolyte; providing a second electrode in contact with said metal on the opposite side of said electrolyte; providing a difference of electrical potential between said first electrode and said second electrode in polarity arrangement adapted to cause unidirectional flow of cations of said metal from said salt through said solid electrolyte and convert said cation to ele-

mental metal, said solid electrolyte comprising a crystalline structure consisting of a crystal lattice and cations of said metal which migrate in relation to said crystal lattice under influence of an electric field, at least a major portion by weight of said cyrstal lattice consisting of ions of aluminum and oxygen in crystal lattice combination,

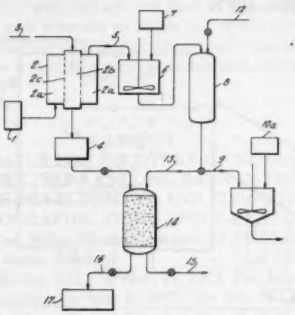
wherein the improvement comprises disposing a molten secondary electrolyte adjacent to and contiguous with said opposite side of said solid electrolyte, said secondary electrolyte comprising a molten salt of said metal being recovered and being (i) ionically conductive to cations of said metal being recovered, (ii) substantially electronically insulating, (iii) substantially insoluble in said recovered molten metal and (iv) nonreactive with said solid electrolyte and said recovered molten metal.

4,108,744

RECOVERY OF THE ZINC CONTAINED IN THE RESIDUAL SOLUTIONS OBTAINED AFTER ELECTROLYTIC DEPOSITION

Jean-Pierre Bernat, Pau, and Jean Sors, Bollene, both of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Filed Apr. 1, 1977, Ser. No. 783,699
Claims priority, application France, Apr. 2, 1976, 76 09587
Int. Cl.[2] C25C *1/16*; C25D *21/16, 21/22*
U.S. Cl. 204—119 **11 Claims**



1. A method for recovering zinc and sulfuric acid from a residual aqueous solution containing more than 50 grams of H_2SO_4 per liter which remains after carrying out electrolytic zinc deposition process, the method comprising the following steps:

(a) dialyzing the solution to form a first solution containing the zinc and up to 50 grams per liter of H_2SO_4 and a second solution containing more than 50 grams H_2SO_4 per liter;

(b) adding to the first solution thus obtained at least 4 moles of NaCl per atom of zinc present, whereby the zinc is complexed;

(c) contacting the zinc complexed first solution with an anion exchange resin;

(d) separating the resulting first solution containing substantially no zinc from the anion exchange resin, and

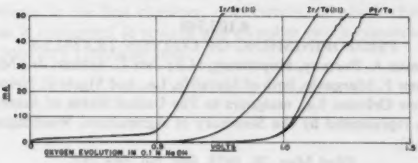
(e) eluting the anion exchange resin to recover the zinc therefrom.

4,108,745

SELENIUM-CONTAINING COATING FOR VALVE METAL ELECTRODES AND USE

Divna Cipris, Morristown, N.J., and Dirk Pouli, Williamsville, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 11, 1977, Ser. No. 786,704
Int. Cl.[2] C25B *1/02, 11/08, 11/10*
U.S. Cl. 204—129 **18 Claims**



1. In the process for a electrolytically generating oxygen by passing an electrical current through an acidic or

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4,108,746

METHOD OF OXIDATIVE DEGRADATION OF PHOSPHOROUS ESTERS

Theodore Mill, Palo Alto; Constance W. Gould, Menlo Park, both of Calif.; Joseph Epstein, and Leon J. Schiff, both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 8, 1977, Ser. No. 831,564
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R **14 Claims**

1. A method for oxidatively degrading an alkyl methylphosphono compound selected from the group consisting of O-alkyl methylphosphonic acid and its esters to give the oxidation products phosphoric acid, carbon dioxide and water comprising the steps of preparing an aqueous mixture of said alkyl methylphosphono compound, mixing the resulting aqueous mixture with a two to five molar excess of a source of free hydroxy radicals, saturating the resulting solution with UV radiation at a wave length below 300nm to thereby initiate oxidation of the alkyl methylphosphono compound and continuing said irradiation for one to two hours for complete oxidation.

4,108,747

CURABLE COMPOSITIONS AND METHOD FOR CURING SUCH COMPOSITIONS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,149
Int. Cl.[2] C08F *2/50, 4/00*
U.S. Cl. 204—159.18 **6 Claims**

1. Curable compositions comprising:

(A) a cationically polymerizable organic material selected from the class consisting of oxirane containing organic resins, vinyl organic monomers, vinyl organic prepolymers, cyclic organic ethers, cyclic organic esters, cyclic organic sulfides, cyclic amines and organic silicon cyclics, and

(B) from 0.1% to 10% by weight of the cationically polymerizable organic material of the radiation sensitive sulfonium salt of the formula,

$$[(R)_a(R^1)_b(R^2)_cS] + [XSO_3]^-,$$

where R is a monovalent aromatic organic radical, R^1 is a monovalent organic aliphatic radical selected from alkyl, cycloalkyl and substituted alkyl, R^2 is a polyvalent organic radical forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals, *a* is a whole number equal to 0 to 3 inclusive, *b* is a whole number equal to

0 to 2 inclusive, *c* is a whole number equal to 0 to 1, where the sum of $a + b + c$ is a value equal to 3, and X is a member selected from aromatic hydrocarbon radicals having from 6–13 carbon atoms, alkyl radicals having from 1–8 carbon atoms, halogenated derivatives thereof and fluorine.

4,108,748

PHOTOFINISHING OF COTTON TEXTILES

Norman A. Portnoy, Hopatcong, N.J.; Jett C. Arthur, Jr.; Matthew F. Margavio, both of Metairie, La., and Marie C. Nelson, New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 28, 1975, Ser. No. 563,257
Int. Cl.[2] C08L *1/08;* B01J *1/10*
U.S. Cl. 204—159.12 **4 Claims**

1. A process for imparting to cotton fabrics the desirable durable-press property of wrinkle recovery while retaining the natural properties of untreated cotton, the process comprising:

(a) impregnating an acrylated cotton fabric of about from 0.08 to 0.5 degree of substitution with a 0.5 to 4.0% acrylamide solution in a solvent mixture of water and N,N-dimethylformamide wherein the water content or the N,N-dimethylformamide content can vary from 10 to 100%,

(b) subjecting the wet impregnated acrylated cotton fabric of (a) to a photolyzing treatment consisting of exposing the impregnated fabric to near ultraviolet light of 3100 to 4000 Angstrom units, with maximum intensity of about 3500 Angstrom units, for about from 30 minutes to 22 hours, in an inert atmosphere to initiate a free-radical crosslinking reaction between substituted acrylate groups on cotton as well as substituted acrylate groups and cotton to obtain a crosslinked, durable-press fabric, and

(c) washing and drying the photolyzed acrylated and crosslinked fabric.

4,108,749

IRRADIATION PROCESS FOR THE PREPARATION OF POLY(VINYL CHLORIDE-G-ISOBUTYLENE) COPOLYMERS

Georg Gustav Anton Bohm; Prakash Druman Trivedi, both of Akron, and Joseph Kestutis Valaitis, Brecksville, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 25, 1977, Ser. No. 827,534
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.17 **5 Claims**

1. A process for the preparation of a graft copolymer comprising the steps of:

irradiating a quantity of PVC resin to form reactive sites in an environment substantially free from ambient air and extraneous impurities said irradiation dose being more than 2 to about 15 Mrads;

dissolving said irradiated PVC resin in a suitable solvent;

adding a monomeric charge of isobutylene monomer and a catalytic amount of a trialkyl aluminum compound to said irradiated resin dissolved in said solvent at a temperature of from about −70° C to about 0° C whereby said reactive sites and said trialkyl aluminum compound initiate polymerization of said monomer; and,

thereafter terminating the reaction and precipitating the graft copolymer product.

4,108,750

METHOD FOR ELECTRODEPOSITION

Edward L. Jozwiak, Jr., Gibsonia, and Suryya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 599,747, Jul. 28, 1975, Pat. No. 4,055,527. This application Jun. 22, 1977, Ser. No. 808,853
Int. Cl.[2] C25D *13/06*
U.S. Cl. 204—181 R **9 Claims**

1. A method of coating an electrically conductive surface which comprises passing an electric current between an electrically conductive anode and an electrically conductive cathode in contact with a water-dispersed coating composition comprising a resinous vehicle which is the addition polymerization reaction product of:

(A) a diene with

(B) an at least partially neutralized reaction product of:

(1) an unsaturated dicarboxylic acid or its anhydride with

(2) a drying oil

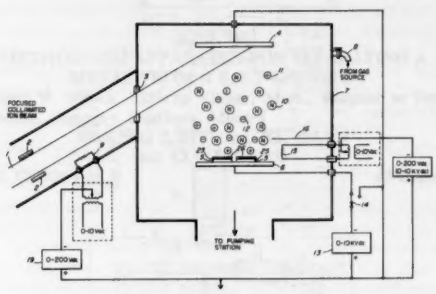
said polymeric reaction product having been prepared in aqueous medium in the presence of an oil-soluble free radical polymerization catalyst and a chain transfer agent.

4,108,751

ION BEAM IMPLANTATION-SPUTTERING

William J. King, 9 Putnam Rd., Reading, Mass. 01867

Filed Jun. 6, 1977, Ser. No. 803,571
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 N **13 Claims**



1. Method of depositing onto and implanting into a substrate at least one layer of at least one material comprising directing a primary beam of ions at a target surface of said material at an energy sufficient to sputter neutral atoms and molecules and ionized particles from said target surface material, placing a surface of said substrate in the path of said neutral atoms and molecules and ionized particles, and accelerating said ionized particles towards said substrate surface, thereby increasing the penetration of said particles into said substrate.

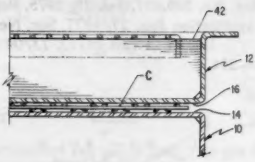
12. Apparatus for ion beam sputtering comprising in combination support means for a substrate, means for directing a primary beam of ions at a target at an energy sufficient to sputter neutral particles and ionized particles from said target towards said substrate, and means for accelerating said ionized particles towards said substrate thereby increasing the penetration of said particles into said substrate.

13. Apparatus of claim 12 wherein said means for accelerating comprises a direct current voltage applied to said substrate.

4,108,752
ELECTROLYTIC CELL BANK HAVING SPRING LOADED INTERCELL CONNECTORS

Gerald R. Pohto, Mentor, and Michael Joseph Kubrin, Chardon, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 31, 1977, Ser. No. 801,552
Int. Cl.[2] C25B 9/00
U.S. Cl. 204—256 12 Claims



1. An electrolytic cell bank comprising:

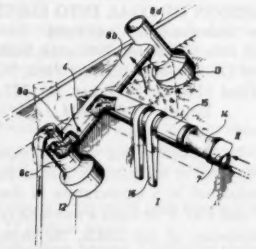
a plurality of electrolytic cell units, each unit comprising an anode pan, a cathode pan, and a separator, said anode pan and separator enclosing an anode compartment having an anode and anolyte therewithin; said cathode pan and separator enclosing a cathode compartment having a cathode and catholyte therewithin; and at least one access port in each of said compartments for adding electrolyte and removing products therefrom, each of said compartments having an exterior face parallel to said separator and

a plurality of conductive strips each having a plurality of louvers having edges thereon defining a plurality of contact points wherein at least one conductive strip is interposed between the exterior face of an anode pan of one cell unit and the adjacent exterior face of a cathode pan of an adjacent cell unit, said louvers being in compressive contact with said exterior faces of both said anode and cathode pans whereby an anode pan of one cell unit, each said conductive strip and a cathode pan of an adjacent cell unit form a bipolar electrode within said electrolytic cell bank.

4,108,753
APPARATUS FOR RECOVERY OF RE-USABLE SUBSTANCES FROM A FIXING BATH IN PROCESSES FOR DEVELOPMENT AND FIXING OF PHOTOGRAPHIC FILMS AND X-RAY FILMS

Östen Lindgren, Solna, Sweden, assignor to AB Metall & Bergprodukter, Solna, Sweden

Division of Ser. No. 632,274, Nov. 17, 1975, Pat. No. 4,042,473.
This application May 6, 1977, Ser. No. 794,475
Claims priority, application Sweden, Dec. 4, 1974, 7415216
Int. Cl.[2] C25B 13/02
U.S. Cl. 204—263 5 Claims

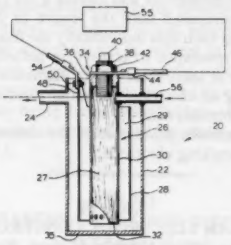


1. Recovery apparatus for the electrolytic recovery of silver from fixing bath solutions obtained by development of photographic films and X-ray films comprising: a tank connected to the development fixing bath, said tank containing the anodes and cathodes for the electrolytic process, and being subdivided into first and second chambers by a separating wall; and a flow guiding device disposed above said separating wall and by means of a rocker and floaters operative to automatically guide the solution flowing from the development fixing baths to the first chamber until this chamber is filled, whereupon silver precipitation is started in this chamber, and to the second chamber which is filled with liquid during the precipitation process in the first chamber, respectively, of which chamber one is connected to sewage and chamber two is connected to a recovery chemicals tank.

4,108,754
CARBON FIBER ELECTRODE

Bernard Fleet, London, and Sankar Das Gupta, New Malden, both of England, assignors to Ontario Limited, Toronto, Canada

Division of Ser. No. 599,457, Jul. 28, 1975, Pat. No. 4,046,663.
This application Jun. 27, 1977, Ser. No. 810,246
Int. Cl.[2] C25B 11/02, 11/12, 9/00
U.S. Cl. 204—263 5 Claims



1. An electrochemical reactor comprising:

a container having means defining at least one inlet and at least one outlet and including means defining an electrolyte flow path between the inlet and the outlet;

a working electrode positioned in the electrolyte flow path, the electrode being of a plurality of carbon fibers arranged in a group with each fiber being generally in side-by-side relationship with other fibers so that each fiber makes numerous electrical connections by contact with other fibers over the length of the fiber and such that the group of fibers exhibits a significant thickness in all directions measured perpendicularly of each fiber so that in use electrolyte must take a tortuous path through the group of carbon fibers, each of the fibers having a relatively good electrical conductivity and having a very small maximum thickness compared with the length of the fiber, the length being such that the fibers individually exhibit no significant resistance to transverse deflection, and means coupled to at least some of the fibers electrically for establishing an electrical potential substantially throughout the electrode; and

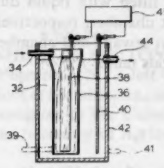
a counter-electrode positioned in the container and spaced from the working electrode.

4,108,755

METALLIC FILAMENT ELECTRODE

Bernard Fleet, London, and Sankar Das Gupta, New Malden, both of England, assignors to Ontario Limited, Toronto, Canada

Division of Ser. No. 599,458, Jul. 28, 1975, Pat. No. 4,046,664.
This application Jun. 27, 1977, Ser. No. 810,253
Int. Cl.[2] C25B *9/00, 11/02*
U.S. Cl. 204—263 3 Claims



1. An electrochemical reactor comprising:

a container having means defining at least one inlet and at least one outlet and including means defining an electrolyte flow path between the inlet and the outlet;

a working electrode positioned in the electrolyte flow path, the electrode being of a plurality of metallic filaments arranged in a group with each filament being generally in side-by-side relationship with other filaments so that each filament makes numerous electrical connections by contact with other filaments over the length of the filaments and such that the group of filaments exhibits a significant thickness in all directions measured perpendicularly of each fiber so that in use electrolyte must take a tortuous path through the group of metallic filaments, each of the metallic filaments having a relatively good electrical conductivity and having a very small maximum thickness compared with the length of the filament, the length being such that individually the filaments exhibit no significant resistance to transverse deflection, and means coupled to at least some of the filaments electrically for establishing an electrical potential substantially throughout the electrode; and

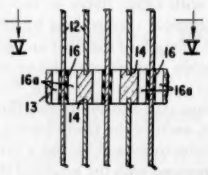
a counter-electrode positioned in the container and spaced from the working electrode.

4,108,756

BIPOLAR ELECTRODE CONSTRUCTION

Oronzio de Nora, Milan; Vittorio de Nora, Nassau, The Bahamas, and Placido M. Spaziante, Milan, Italy, assignors to Oronzio de Nora Impianti Elecrtrochimici S.p.A., Milan, Italy

Division of Ser. No. 514,762, Oct. 15, 1974, Pat. No. 4,032,426.
This application Nov. 26, 1976, Ser. No. 745,403
Claims priority, application Italy, Oct. 30, 1973, 30709 A/73
Int. Cl.[2] C25B *11/00*
U.S. Cl. 204—286 4 Claims



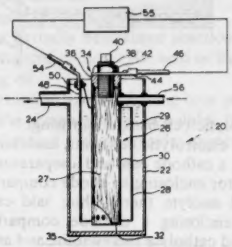
1. A bipolar element for vertical electrolyzers comprising an electrically non-conductive, electrolyte inert divider element with a cross-section adapted to the cross-section of the electrolyzer, a plurality of bipolar electrodes passing through said divider element and evenly distributed over the divider element cross-section with the anode portion and cathode portion extending the same distance from the horizontal surfaces of the divider element and means in said divider for allowing smooth upward flow of the electrolyte therethrough.

4,108,757

CARBON FIBER ELECTRODE

Bernard Fleet, London, and Sankar Das Gupta, New Malden, both of England, assignors to 308489 Ontario Limited, Toronto, Canada

Division of Ser. No. 599,457, Jul. 28, 1975, Pat. No. 4,046,663.
This application Jun. 27, 1977, Ser. No. 810,254
Int. Cl.[2] C25B *11/12, 13/04*
U.S. Cl. 204—294 4 Claims



1. An electrode for use in an electrochemical reactor, the electrode comprising:

a plurality of carbon fibers arranged in a group with each fiber being generally in side-by-side relationship with other fibers so that each fiber makes numerous electrical connections by contact with other fibers over the length of the fiber and such that the group of fibers exhibits a significant thickness in all directions measured perpendicularly of each fiber so that in use electrolyte must take a tortuous path through the group of carbon fibers, each of the fibers having a relatively good electrical conductivity and having a very small maximum thickness compared with the length of the fiber, the length being such that the fibers individually exhibit no significant resistance to transverse deflection so that as electrolyte flows generally through the plurality of carbon fibers and over the individual fibers, flow eddys will tend to cause continuous transverse movement of the fibers relative to one another to enhance electrolytic action at the electrode; and

means coupled to at least some of the fibers over a discrete portion of the length of the fibers and providing electrical connection means for coupling the electrode to an external electrical circuit.

4,108,758

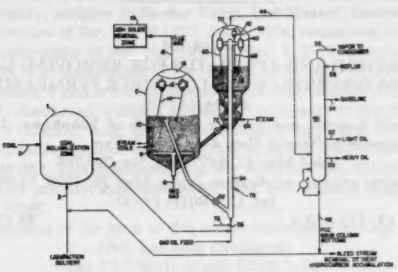
CONVERSION OF COAL INTO LIQUID FUELS

Hans-Juergen Schoennagel, Lawrence Township, Mercer County, and John C. Zahner, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,486
Int. Cl.[2] C10G *1/04, 1/08*
U.S. Cl. 208—8 4 Claims

1. In a process for converting coal into liquid fuel products by solubilizing coal in a thermally stable, highly polycyclic aromatic residual oil at a temperature in the range between about 350° F and 850° F to form a solvated coal solution containing a suspension of ash solids, the improvement which comprises charging the solvated coal solution and suspended ash solids to a fluidized catalytic cracking zone in admixture with gas oil feed under cracking conditions; separating and recovering a hydrocarbon phase and a catalyst-ash solids phase

from the catalytic cracking conversion zone effluent; passing the catalyst-ash solids phase into a catalyst regeneration zone;



and removing entrained ash solids from flue gas effluent of the catalyst regeneration zone.

4,108,759

PROCESS AND APPARATUS FOR CONVERTING COAL INTO OIL AND OTHER COAL DERIVATIVES

Serenus H. A. Young, Apt. S-3, 1716 Terrell Mill Rd., Marietta, Ga. 30060

Filed Jun. 30, 1975, Ser. No. 591,614
Int. Cl.[2] C10G *1/08;* B01G *11/02;* B01J *1/12*
U.S. Cl. 208—10 25 Claims

1. A process for converting coal into liquid coal derivatives, which includes continuously gasifying pulverized coal to provide hydrogen and separately and continuously liquefying pulverized coal to provide a liquid effluent containing fractionable oil and a hydrogenating liquid, including the steps of:

a. providing a slurry composed of pulverized coal and a hydrogenating liquid,
b. locating the slurry in a closed, substantially oxygen-free, pressure vessel,
c. heating the slurry in the vessel,
d. maintaining the slurry in the vessel at a selected elevated temperature and superatmospheric pressure,
e. insonating the heated slurry by ultrasonic shock waves radiated into the vessel and
f. introducing hydrogen produced by the gasification of the pulverized coal into the heated slurry during insolation of the heated slurry.

4,108,760

EXTRACTION OF OIL SHALES AND TAR SANDS

Derek Farnham Williams, London, and Terence Geoffrey Martin, Winchcombe, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jul. 24, 1975, Ser. No. 598,653
Claims priority, application United Kingdom, Jul. 25, 1974, 32892/74
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE 17 Claims

1. A process for the extraction of oil shales and tar sands comprising heating the shale or sand in the presence of an extractant gas selected from the group consisting of

ethylene,
carbon dioxide,
aromatic hydrocarbons having a single benzene ring,
aromatic hydrocarbon having a single benzene ring substituted with not more than 4 carbon atoms in a substituent group,
alicyclic hydrocarbon having at least 5 carbon atoms and not more than 12 carbon atoms,
aromatic hydrocarbon having 2 aromatic rings,
aliphatic hydrocarbon having at least 5 carbon atoms and not more than 16 carbon atoms,
phenol derived from an aromatic hydrocarbon having up to 8 carbon atoms,
alcohol,
aldehyde,
ketone,
ether,
ester,
aliphatic mono, di- and tri-amines having at least 4 and not more than 10 carbon atoms,
acyclic aliphatic amines and
aromatic amines having a benzene ring in the absence of externally supplied hydrogen to extract extractable constituents therefrom, separating the extractant and extract from the residue and recovering the extract from the extractant characterized in that the extractant is a gas phase extractant and the extraction is carried out at a temperature within the range of 0° to 550° C at a pressure not less than the critical pressure, the extractant being above its critical temperature by not more than 200° C and said temperature being within the range of 350° to 550° C when extracting oil shales.

4,108,761

DENITRIFICATION OF CARBONACEOUS FEEDSTOCKS

Morgan C. Sze, Upper Montclair; Abraham P. Gelbein, Plainfield, and Joon T. Kwon, Freehold Township, Monmouth County, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 574,255, May 5, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,208
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—254 H 12 Claims

1. A process for hydrodenitrification of a nitrogen-containing carbonaceous feedstock having a nitrogen content of at least 0.5 weight % comprising:

effecting hydrodenitrification in the presence of a supported sulfided catalyst containing nickel, molybdenum and iron wherein the molybdenum is present in an amount from about 10% to about 20%, by weight, calculated as MoO_3, based on total weight of catalyst, the iron to molybdenum atomic ratio being from about 0.05 to about 0.5 and the nickel to molybdenum atomic ratio being from about 0.3 to about 0.5.

4,108,762

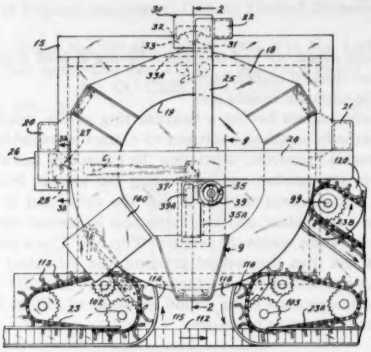
TRANSPARENT CONTAINER INSPECTION APPARATUS

Momir Babunovic, Des Peres; James R. Gender, Kirkwood; Siamac Faani, Ferguson, and Mihai A. Bulboaca, Lemay, all of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Continuation of Ser. No. 615,562, Sep. 22, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,739
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—111.7 T 13 Claims

1. A method of inspecting transparent containers for foreign objects, said method comprising the steps of gripping and creating a flow of containers in predetermined spaced relation along a curved path having a predetermined radius of curvature, directing the container flow through inspection stations that are spaced apart, causing the motion of the containers through the inspection stations to initiate the inspection steps which at certain stations energizes a source of illumination for passing a beam of light through the containers, directing the emerging lighted container images in directions which are coincident with the predetermined radius of curvature and coinciding at a common place of intersection, directing photosensitive scanning means toward said place of intersection of the lighted images to receive and scan the successive illuminated images for changes in the intensity of the illumination, and turning the gripped containers between inspection stations to align a different side of the containers with the sources of

illumination and thereby to present a different illuminated image to the photosensitive means, and controlling the time of



energization of the source of illumination so that one lighted image of a container at a time is scanned.

4,108,763

CONTINUOUS TREATMENT OF LIQUID EFFLUENT AND SEWAGE

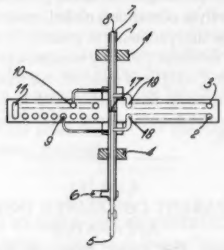
George Francis Gilbert Clough, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 26, 1977, Ser. No. 800,854

Claims priority, application United Kingdom, Jun. 8, 1976, 23604/76

Int. Cl.[2] C02C *1/08*; B01F *3/04*

U.S. Cl. 210—14 **7 Claims**



1. A method for the treatment of liquid-borne sewage or effluent in which the liquid is circulated firstly through a tubular coil, the compression coil, which is rotating about a substantially vertical axis, the pressure exerted on the liquid increasing continuously as the liquid passes from the innermost end of the coil to the outermost end of the coil, and secondly through a tubular coil, the decompression coil, which is rotating about a substantially vertical axis, the pressure exerted on the liquid decreasing continuously as it passes from the outermost end of the coil to the innermost end of the coil, an oxygen-containing gas being supplied to the liquid as it passes through the compression coil to flow co-currently with the liquid.

2. An apparatus for the treatment of liquid-borne sewage or effluent comprising a first tubular coil, the compression coil, a second tubular coil, the decompression coil, the two coils communicating with each other at their outer ends, means for rotating the two coils about the same substantially vertical axis, means for introducing the liquid-borne sewage or effluent into the inner end of the compression coil and circulating the liquid successively through the compression coil and the decompression coil, means for supplying an oxygen-containing gas to the liquid circulating in the compression coil to flow co-currently therewith, and means connected to the inner end of the decompression coil for recirculating to the compression coil at least a portion of the sludge carried by the circulating liquid.

4,108,764

METHOD AND APPARATUS FOR REMOVING GAS FROM INTERIOR OF HOLLOW-FIBER PERMEABILITY APPARATUS

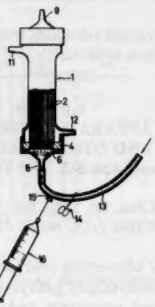
Noriaki Kaneko, and Yasushi Joh, both of Yokohama, Japan, assignors to Nippon Ceon Co., Ltd., Tokyo

Filed May 17, 1977, Ser. No. 797,765

Claims priority, application Japan, May 20, 1976, 51-58299

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—22 A **55 Claims**



1. A method for removing gas from the interior of a hollow-fiber permeability apparatus in which a permeating region of a housing contains a bundle of hollow fibers, and materials can selectively permeate through the membranes formed by the permeable walls of the hollow fibers, between first and second fluids flowing through said housing inside and outside said fibers respectively, comprising the steps of:

(A), reacting a first material with a second material in at least one part of said apparatus, to produce carbonic acid gas; and

(B) substituting the gas previously existing in the interior of said housing with said produced carbonic acid gas.

4,108,765

MEMBRANE SEPARATION OF METHANOL FROM FORMALDEHYDE AQUEOUS MIXTURES

Cheng H. Lee, Creve Couer, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 636,396, Dec. 1, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,748

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 R **12 Claims**

1. A process for separating methanol from formaldehyde-aqueous mixtures comprising: contacting the aqueous mixtures consisting of water, methanol and formaldehyde with a first surface of a hydrophobic polymeric membrane selectively permeable to the methanol over the formaldehyde selected from the group consisting of polyolefins, polysilicones, polyurethanes and cellulose tri-long-chain alkanoate; maintaining a second and opposite membrane surface at a lower chemical potential for the methanol than the first membrane surface; permeating a portion of the methanol into and through the membrane; and withdrawing at the second membrane surface a mixture having a higher total concentration of methanol in relationship to formaldehyde than the respective methanol to formaldehyde concentrations contained in the aqueous feed mixtures.

4,108,766

ION EXCHANGE PROCESS WITH COUNTER-CURRENT FRACTIONAL REGENERATION

Sandor Vajna, Reichenbergerstrasse 30 a, 534 Bad Honnef, Germany, assignor to Sandor Vajna, Bad-Honnef, Germany

Continuation of Ser. No. 703,033, Jul. 6, 1976, abandoned, which is a continuation of Ser. No. 636,482, Dec. 1, 1975, abandoned, which is a continuation of Ser. No. 571,876, Apr. 25, 1975, abandoned, which is a continuation of Ser. No. 165,586, Jul. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 754,531, Aug. 19, 1968, abandoned, which is a continuation-in-part of Ser. No. 431,479, Feb. 9, 1965, Pat. No. 3,448,043. This application Jul. 22, 1977, Ser. No. 818,035

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1967, 53897

The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.

Int. Cl.[2] B01D *15/06*; C02B *1/76*

U.S. Cl. 210—32 **10 Claims**

1. In an ion exchange process wherein an ion exchange bed is successively charged and discharged during an exchange cycle with an ion, here designated as "X" ion, with "Y" being used to designate the replacing ion and "Z" the oppositely charged ion associated with X and Y, by passing aqueous solutions of said ions therethrough, with the flow thereof during charging being in one direction and during discharging in the opposite direction; the improvement in the charging or discharging of the bed which comprises, in terms of discharging of the bed starting with said bed charged with X ions and filled with water substantially free of X, Y, and Z ions, comprising passing at least four groups of fractions through said bed, as follows:

(1) a first feed group of fractions, containing X, Y and Z ions, the concentration of Z ions remaining substantially constant, the concentration of X ions successively decreasing downwardly to or near to zero and the concentration of Y ions correspondingly increasing

(2) a second feed group of fractions containing Y and Z ions at the concentration of each Y and Z ions substantially equal to the concentration of Z ions in the previous group and free of X ions, being introduced as feed to the process

(3) a third feed group of fractions containing Y and Z ions, the concentrations of which successively decrease to or near to zero, and

(4) a fourth feed group of fractions consisting essentially of pure water free of X, Y, and Z ions;

recovering from said bed at least 3 effluent groups of fractions, as follows:

(a) a first effluent group of fractions containing the displaced water of the bed and a solution containing predominantly X ions and minor amounts of Y ions, both associated with Z ions, which group is removed from the process,

(b) a second effluent group of fractions, identical to said first feed group, and

(c) a third effluent group of fractions, identical to said third feed group;

and collecting said second and third effluent groups and using the same in a subsequent discharge portion of a cycle of said process.

4,108,767

SEPARATION OF AN AQUEOUS OR WATER-MISCIBLE LIQUID FROM A FLUID MIXTURE

William D. Cooper, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Sep. 2, 1975, Ser. No. 609,249

Int. Cl.[2] B01D *11/04, 17/04*

U.S. Cl. 210—42 S **12 Claims**

1. A process for the removal from a fluid of an aqueous or a water-miscible liquid dispersed in the fluid, which comprises adding to the fluid a water-soluble ferromagnetic composition selected from the group consisting essentially of ferromagnetic iron lignosulfonates, ferromagnetic iron sulfonated tannins, and ferromagnetic sulfonated phenols condensed with an aldehyde, said ferromagnetic composition being prepared by dissolving an iron compound in an aqueous solution of the lignosulfonate, sulfonated tannin, or sulfonated phenol condensed with an aldehyde in an amount at least twice the stoichiometric amount to react with the sulfonate groups and reacting the mixture under conditions for the formation of magnetic iron oxide in the presence of an alkali and having the iron present in ferrous and ferric states, intermixing the ferromagnetic composition with the fluid in the presence of sufficient water to dissolve and mix a portion of the ferromagnetic composition with the dispersed liquid, and passing the fluid containing the ferromagnetic composition mixed with the dispersed liquid through a magnetic field to attract and separate the dispersed liquid containing the ferromagnetic composition from the fluid, said ferromagnetic composition being added to the fluid in a sufficient amount to mix with the dispersed liquid for the dispersed liquid to be attracted by the magnetic field.

4,108,768

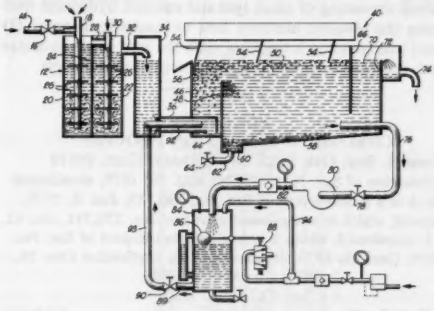
METHOD OF CLARIFYING INDUSTRIAL WASTE WATER

Robert V. Sebelik, Forest Park, and Wilfried Schaefer, Des Plaines, both of Ill., assignors to Winchester Chemical Co., Franklin Park, Ill.

Filed Aug. 27, 1976, Ser. No. 718,353

Int. Cl.[2] B01D *17/04*

U.S. Cl. 210—43 **8 Claims**



1. A method of clarifying an industrial waste water containing hexane soluble oil or grease comprising

raising the pH of the waste water to a value of at least 11.6;

adding calcium chloride to the waste water in an amount of at least 1,700 parts per million parts of waste water to flocculate a substantial portion of said oil or grease;

adding a floc coagulant to said waste water to agglomerate said floc into clumps; and

removing said floc clumps.

4,108,769

PROCESS FOR REDUCING THE MERCURY CONTENT OF INDUSTRIAL WASTE WATERS

Martin Krieg, Gablingen, and Theo Olffers, Gersthofen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1977, Ser. No. 780,126

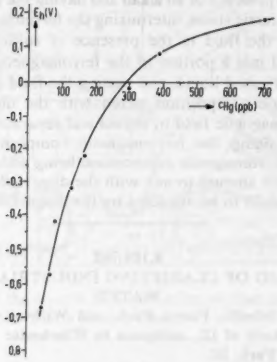
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613128

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—50 **3 Claims**

1. A process for reducing the mercury content of industrial waste waters to about only 50 mg/m^3 by precipitating the mercury compounds from the waste waters after having converted the total amount of mercury contained in such waters to the ionic bivalent oxidation state by adjusting first the waste

water to a pH-value of 4.5 or less by the addition of hydrochloric acid or sulfuric acid, and then adding such an amount of chlorine, chlorinated water or sodium hypochlorite that a content of from 2 to 50 mg of active chlorine per liter waste water is present, which comprises subsequently adding to the waste water, pre-treated in this way, iron (II) ions until a content of from 0.1 to 1.5 g of such ions per liter of waste water



is attained, then adjusting a redox potential of from −0.1 to −0.8 volts, relative to the normal hydrogen electrode by addition of a chemical agent increasing the pH selected from the group consisting of alkali lyes and calcium hydroxide thus reducing the bivalent mercury ions to insoluble mercury (I) salt, and precipitating it together with the iron oxide hydrates formed, and finally eliminating the precipitated products.

4,108,770

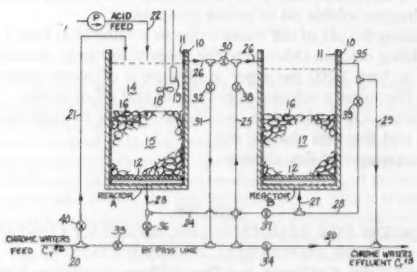
CHROMIUM REDUCTION PROCESS

Clarence H. Roy, Oak Ridge Dr., Bethany, Conn. 06510

Continuation of Ser. No. 606,024, Aug. 20, 1975, abandoned, which is a continuation of Ser. No. 430,735, Jan. 4, 1975, abandoned, which is a continuation of Ser. No. 270,711, Jul. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 83,120, Dec. 10, 1970, abandoned. This application Oct. 18, 1976, Ser. No. 733,354

Int. Cl.[2] C02C *5/02*

U.S. Cl. 210—50 **8 Claims**



1. A continuous process effective by gravity flow for the substantially complete reduction of hexavalent chromium compounds in industrial process waters containing the same to trivalent chromium compounds with minimal sludge formation, comprising the steps of:

(a) adjusting and maintaining the pH of said waters to 1.0 to 2.1 by addition of sulfuric acid to acidify said waters, and

(b) reactably contacting said waters by continuous gravitational flow through a bed of non-powdery elemental iron particles, said particles having a volume equivalent to particles of at least ¼ inch in length and width and about ¼ inch in thickness, whereby at least stoichiometric proportions of sulfuric acid and said hexavalent chromium compounds are maintained in said waters while said waters are in contact with said bed.

4,108,771

ELIMINATION OF ODORS FROM ORGANIC WASTES

Josef Weiss, Stockholm, Sweden, assignor to Weiss & Co.; Kemiska Konsultbyran A.G. and Chemical Consults Corp., Ltd., all of Stockholm, Sweden

Continuation of Ser. No. 643,821, Dec. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 439,879, Feb. 6, 1974, abandoned. This application May 27, 1977, Ser. No. 801,350

Int. Cl.[2] C02B *1/34;* C02C *1/40, 5/04*

U.S. Cl. 210—50 **3 Claims**

1. A method of reducing air-polluting odors including odor-producing compounds of organic sulfur compounds and ammonia emanating from a solids-containing waste product selected from the group consisting of organic waste products produced by metabolic processes including animal and human wastes, organic industrial wastes and sewage sludges which comprises,

forming a mixture of said odorous solids-containing waste product with an effective odor-abating amount of an aqueous acid solution containing by weight about 3 to 25% sulfuric acid, about 3 to 20% of an oxidizing agent selected from the group consisting of water soluble persulfates, nitrates, chlorates and permanganates of ammonium ion and alkali metals sufficient to oxidize said solids-containing waste product and substantially reduce the odor thereof and about 10 to 40% of a sulfur precipitating agent selected from the group consisting of water-soluble ferrous and ferric compounds sufficient to form precipitates with sulfur contained in said odor-producing compounds, and maintaining said mixture at a pH not exceeding 6.5 until said odor has been substantially abated.

4,108,772

SLUDGE DISINFECTION

Samuel Ray Alexander, Houston, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 672,034, Mar. 30, 1976, abandoned. This application Feb. 1, 1977, Ser. No. 764,581

Int. Cl.[2] C02B *3/10*

U.S. Cl. 210—64 **2 Claims**

1. A method of disinfecting biological sludge, said sludge having a TSS value between about 8,000 and 30,000 ppm and a VSS value between about 4,000 and 15,000 ppm, comprising contacting said sludge with a stabilizing amount of zinc and adjusting the basicity of the zinc/sludge mixture to a pH of about 10 to 11.

4,108,773

OIL SALVAGER

Salvatore Macaluso, 6 Firwood Dr., Farmingville, N.Y. 11738

Continuation-in-part of Ser. No. 762,296, Jan. 25, 1977, abandoned. This application Oct. 11, 1977, Ser. No. 840,953

Int. Cl.[2] B01D *17/02*

U.S. Cl. 210—122 **9 Claims**

1. A contaminent salvager; comprising:

(a) chamber means of a size and configuration to receive and hold a predetermined quantity of fluid having a contaminent, said contaminent being of a lesser density and immiscible with said fluid, and wherein said chamber is sized to permit separation of said fluid and contaminent into immiscible layers.

(b) carrying means for positioning said chamber means in a body of fluid which may have a contaminent floating upon its surface, wherein said carrying means is a water-going vessel of the catamaran type having a pair of pontoons disposed one to each side of said chamber means;

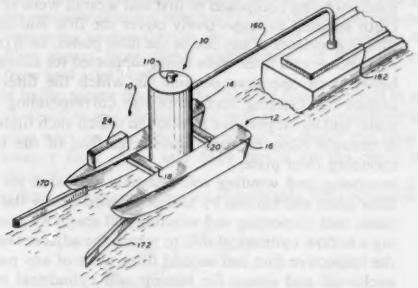
(c) means to fill said chamber means to an operating level;

(d) buoyancy regulation means comprising the elements of contaminated fluid inlet means leading directly into said chamber means proximate a lower portion thereof and being disposed between said pontoons;

fluid outlet means leading directly from said chamber means proximate said lower portion thereof and spaced from said contaminated fluid inlet means;

contaminent outlet means disposed proximate an upper portion of said chamber means;

atmosphere communication means connecting said upper portion of said chamber means to the atmosphere above said position of said contaminent outlet mean;



means for creating relative movement between said chamber means and the contaminated fluid so that contaminated fluid enters said inlet means; the contaminent floating up through said predetermined quantity of fluid to form a layer thereupon; and

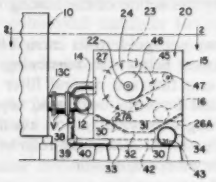
at least one fluid door means disposed below the level of said inlet and outlet means, and being openable and closable to the body of fluid to permit selective communication therewith, said elements functioning singly or in any combination thereof to maintain said salvager at a substantially constant buoyancy.

4,108,774

CONTAINER WASHER HAVING EXTERNAL LABEL FILTER AND SEPARATOR WITH FILTER FLUSHING MEANS

Momir Babunovic, Des Peres, and Donald E. Whitlock, Creve Coeur, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Oct. 13, 1976, Ser. No. 732,025
Int. Cl.[2] B08B 9/08
U.S. Cl. 210—167 **11 Claims**



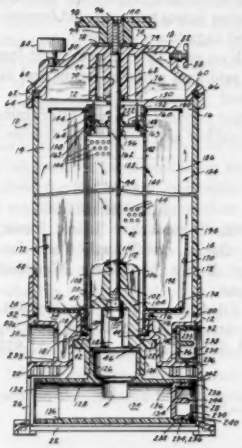
1. In container washer apparatus for clearing labels which have become detached from containers from container washing solution, the improvement in the container washer apparatus of: a casing structure external to the container washer formed with a filter chamber and a discharge chamber in flow communication, conduit means connected between said container washer and said filter chamber for delivery thereto of washing solution burdened with labels, filter means in said filter chamber positioned for intercepting labels in the washing solution as it flows into said discharge chamber, first washing solution circulating means connected between said discharge chamber and said container washer for establishing a flow of washing solution burdened with labels into said filter chamber and washing solution substantially free of labels back to said container washer; and second washing solution circulating means including label separator means having an inlet connected into said filter chamber to receive washing solution burdened with labels intercepted by said filter means the connection of said separator means with said filter chamber subjecting said separator means to a hydrostatic head pressure, said separator means having a first outlet for discharge of labels and a second outlet for discharge of washing solution substantially free of labels, and a conduit connected to said second outlet and extending to a discharge end adjacent said filter means in said filter chamber for applying washing solution to said filter means for dislodging labels from said filter means.

4,108,775

CARTRIDGE FILTER

Robert D. Wilkes; Alan H. Peters, both of Little Rock, Ark., and Virgil J. Jacuzzi, Islington, Canada, assignors to Jacuzzi Bros. Inc., Little Rock, Ark.

Filed Apr. 21, 1977, Ser. No. 789,699
Int. Cl.[2] E04H 3/20
U.S. Cl. 210—169 **13 Claims**



1. A filter adapted for use in a swimming pool water purification system, comprising:

a filter housing having inlet and discharge ports;

a core assembly carried removably within said housing and including a hollow perforate core connecting with the discharge port,

a coreless filter cartridge disposed on and about said perforate core with a readily disassemblable longitudinal sliding fit and having a filter media to filter water flowing from said inlet port through said filter and said core to said discharge port;

said filter cartridge being adapted to be readily and inexpensively replaced inasmuch as said cartridge is without a core;

and a cup-shaped pollutant trapping member secured fixedly in assembly with the lower end of said core and supporting said filter cartridge so that the assembly can be handled as a unit for removal and replacement with respect to the filter housing.

4,108,776

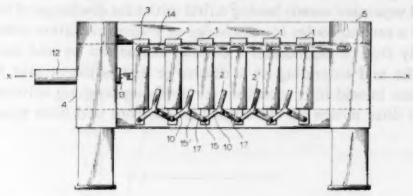
FILTER PRESS

Masayoshi Kubo, and Hideaki Katayama, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,822

Int. Cl.[2] B01D *25/12*

U.S. Cl. 210—224 **2 Claims**



1. A filter press comprising:

a filter press frame;

at least one pair of parallel filter frames slidably mounted in said frame, a filter chamber being created between said pair of filter frames;

liquid-feed member means between said pair of filter frames for feeding liquid to be processed into said filter chamber between said parallel frames;

pivotable link member means connected to each filter frame of said pair of filter frames and to said liquid-feed member means between said frames for maintaining said liquid-feed member means between said frames when said frames are moved together and apart;

a filter cloth on each side of said liquid-feed member means between said feed member means and said adjacent filter frames; and

moving means connected to said filter frames for sliding said frames together and pulling said frames apart.

4,108,777

FILTER PRESS

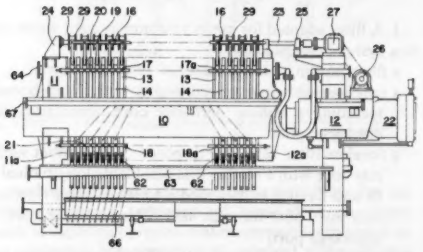
Tetsuya Kurita, Takarazuka; Seiichi Suwa, Yao; Masayuki Nakamura, Osaka, and Takashi Torii, Izumi, all of Japan, assignors to Kurita Machinery Manufacturing Co., Ltd., Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,675

Claims priority, application Japan, Oct. 29, 1976, 51-130671; Jun. 25, 1977, 52-75671; Aug. 1, 1977, 52-92854; Aug. 1, 1977, 52-92855

Int. Cl.[2] B01D *25/38*

U.S. Cl. 210—225 **6 Claims**



1. A filter press which comprises, in combination:

a machine framework including fixed and movable heads, said movable head being supported in position for movement between projected and retracted positions in a direction towards and away from the fixed head, respectively;

a plurality of filter plates supported in position between the fixed and movable heads in face-to-face relation to each other, said filter plates being compressed together to a substantially watertight closure between said fixed and movable heads in response to movement of the movable head from the retracted position towards the projected position and being separated from each other when and so long as said movable head is held in the retracted position, each of said filter plates having first and second filtering surfaces opposed to each other and respectively facing towards the fixed and movable heads;

means for guiding said filter plates to permit the filter plates to be moved incident to the movement of the movable head between the retracted and projected positons;

a filter medium provided for each filter plate, said filter medium being composed of first and second webs of filter cloth adapted to respectively cover the first and second filtering surfaces of any one of the filter plates, each of said first and second filter webs being supported for movement between an operative position, in which the filter web covers the filtering surface of the corresponding filter plate, and an inoperative position in which such filter web is brought clear of such filtering surface of the corresponding filter plate;

a tensioning and winding roll assembly provided for each filter plate and carried by and positioned below the filter plate, said tensioning and winding roll assembly comprising a hollow cylindrical roll, to which the adjacent ends of the respective first and second filter webs of any pair are anchored, and means for biasing said cylindrical roll in one direction about the longitudinal axis of said cylindrical roll with the first and second filter webs of the corresponding pair forced to be wound up around said cylindrical roll;

a support bar positioned between each adjacent two of the filter plates and to which the other end of any one of the first and second filter webs of one pair and the other end of the other of the first and second filter webs of the next adjacent pair are anchored;

a pair of winding elements provided for each filter plate and positioned on respective sides of and above each adjacent two of the filter plates;

a pair of elongated connecting members provided for each pair of the winding elements, said connecting members of each pair being connected at their one end to the opposite ends of the corresponding support bar and at their other end to the corresponding winding elements;

means operable when said movable head is in the retracted position for driving said winding elements of any pair to bring said first and second filter webs of the corresponding pair to the operative position against the biasing means of the associated tensioning and winding roll assembly and to allow the first and second filter webs of said any pair to be drawn onto the associated tensioning and winding roll assembly by the action of the biasing means, selectively; and

a pair of juxtaposed guide rolls carried by each filter plate and positioned below the tensioning and winding roll assembly, said first and second filter webs of the pair, which extend from the associated support bars towards the tensioning and winding roll assembly, being turned respectively around said guide rolls to assume a substantially U-shaped configuration.

4,108,778

SELF-CLEANING FILTER AND VORTEXER

Steven J. Lambert; Bertha E. Lambert, and Warren G. Lambert, all of 2142 Cornwall St., Germantown, Tenn. 38138

Continuation-in-part of Ser. No. 661,367, Feb. 25, 1976, abandoned. This application Mar. 21, 1977, Ser. No. 779,542

Int. Cl.[2] B01D *35/16, 33/06, 45/12*

U.S. Cl. 210—297 **43 Claims**

1. A combination self-cleaning fluid filter and vortexer means for separating particulates from an entraining fluid comprising:

a substantially cylindrical cannister having a tangentially directed inlet port communicating with the interior thereof and a particulate collecting port spaced from said inlet;

a clean fluid outlet port disposed substantially coaxially with the longitudinal axis of said cannister;

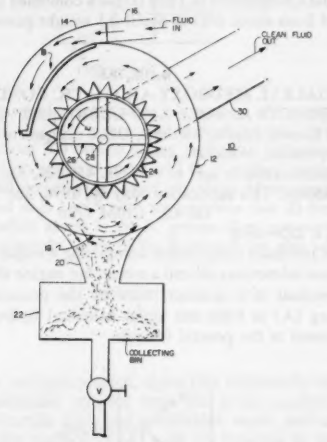
filter means mounted over said outlet port within said cannister;

said filter means being mounted over said outlet port for rotation in the same direction as the flow of entraining fluid and particulates entering said cannister from said inlet to preclude caking of said filter means with said particulate material by dynamic self-cleaning action;

arcuate baffle means intermediate said filter means and said tangentially directed inlet port in said cylindrical cannister enhancing vortex flow in the fluid and for shielding said filter means from direct impingement of fluid material from said inlet port;

said baffle means dividing the flow of fluid material in said vortexer to mix cleaner fluid with fluid material from said inlet port on one side thereof and to direct the flow of cleaner fluid about said filter means on the other side thereof; and

said filter means comprises a self-rotatable filter rotatable by



means of the tangentially directed inlet fluid, said filter means including a plurality of outwardly projecting finger members formed by Corolis curves.

13. A combination fluid filter and vortexer means for separating particles from an entraining fluid comprising:

a substantially cylindrical cannister having a tangentially directed inlet port communicating with the interior thereof and a particulate collecting port spaced from said inlet;

a clean fluid outlet port disposed substantially coaxially with the longitudinal axis of said cannister;

a filter means being mounted over said outlet port for rotation in the same direction as the flow of entraining fluid and particulates entering said cannister from said inlet to preclude caking of said filter means with said particulate material by dynamic self-cleaning action;

said filter means includes a plenum chamber substantially coaxially arranged with the longitudinal axis of said cannister and including means for supporting filter elements;

said plenum chamber further includes means for directing the flow of clean fluid from the cannister; and

said filter means comprises a self-rotatable filter rotatable by means of the tangentially directed inlet fluid, said filter means including a plurality of outwardly projecting finger members formed by Corolis curves.

4,108,779

OIL WELL FLUIDS AND DISPERSANTS

Leroy L. Carney, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 356,239, May 1, 1973, abandoned, Ser. No. 500,999, Aug. 27, 1974, abandoned, and Ser. No. 543,723, Jan. 24, 1975, abandoned, which is a division of Ser. No. 353,060, Apr. 20, 1973, Pat. No. 3,896,031, said Ser. No. 500,999, is a division of Ser. No. 417,431, Nov. 19, 1973, Pat. No. 3,850,248. This application Apr. 15, 1976, Ser. No. 677,199

Int. Cl.[2] C09K *7/02, 7/06*

U.S. Cl. 252—8.5 P **19 Claims**

1. A water-in-oil emulsion spacer fluid which is compatible with drilling fluids and cement compositions and which can be used effectively in a well to separate various types of fluids, cement compositions and combinations thereof without significant alteration in the rheological properties, said spacer fluid comprising about 40–60 parts by volume of a hydrocarbon oil; about 40–60 parts by volume fresh water having, before inclusion of the spacer fluid, a dissolved chloride salt content of less than 1,000 parts per million and a total hardness of less than 500 parts per million; and about 15–40 pounds of an emulsifier composition per barrel of said spacer fluid; said emulsifier composition consisting essentially of about 1–20 weight percent of a first fatty acid amide, wherein the fatty acid precursor contains about 12–18 carbon atoms and the amide contains about 16–22 carbon atoms and about 0.5–10 pounds per barrel of spacer fluid of a surfactant-dispersant comprising a mixture of sulfonated lignin and a second fatty acid amide; wherein for said surfactant-dispersant, said sulfonated lignin is mixed with said second fatty acid amide in an amount equal to about 25–75% of said mixture; wherein said first fatty acid amide is the reaction product of a di-lower alkanol amine and said fatty acid; and wherein the amine precursor of the second fatty acid amide is an alkyl or aryl amino sulfonic acid, wherein the alkyl or aryl radicals contain 1–6 carbon atoms.

18. A water-in-oil emulsion drilling fluid having good stability at high temperature and to the addition of weighting materials comprising oil, water, a basic emulsifier and a surfactant-dispersant effective for dispersing conventional weighting materials in said emulsion comprising a mixture of liquid oleyl amide and sulfonated lignin; said basic emulsifier consisting essentially of a mixture of the reaction product of oleic acid and diethanolamine to form an oleyl amide mixed with dimerized oleic acid; wherein the liquid oleyl amide of said surfactant-dispersant is mixed with the sulfonated lignin in an amount equal to 25–75% of said mixture and the amine precursor is an alkyl or aryl amino sulfonic acid; wherein the alkyl or aryl radicals contain 1–6 carbon atoms; and wherein the dimerized oleic acid is present in said mixture in an amount up to about 30%.

4,108,780

DUSTLESS SOIL RELEASE-SOURING COMPOSITIONS FOR USE IN LAUNDERING

Paul Vernon Thomas, Berwyn, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 19, 1977, Ser. No. 816,994

Int. Cl.[2] D06M *15/08*

U.S. Cl. 252—8.6 **14 Claims**

1. A substantially dustless powdered composition consisting essentially of spray-dried acrylic resin and a dedusting amount of one or more organic alcohols selected from the group consisting of 2-hexyldecyl alcohol and iso-tridecanol.

4,108,781

PRODUCTION OF POLYESTER TIRE YARN

Robert Moore Marshall, Chester, and Kimon Constantine Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 617,547, Sep. 29, 1975, Pat. No. 4,054,634. This application Feb. 18, 1977, Ser. No. 770,124

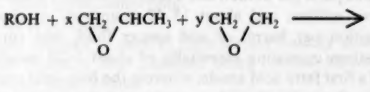
The portion of the term of this patent subsequent to May 1, 1990, has been disclaimed.

Int. Cl.[2] D06M *13/18*

U.S. Cl. 252—8.9 **6 Claims**

1. A two-part fiber finish composition, particularly for application to polyethylene terephthalate yarn prepared by a process involving spinning and drawing steps, said yarn to be made into tire cord using a single-dip treatment, said two-part finish composition consisting of:

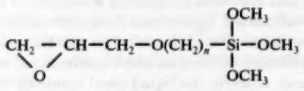
(a) a first finish composition consisting essentially of a polyalkylene glycol compound which is a mixed polyoxyethylated-polyoxypropylated monether prepared in accordance with the equation:



$$ROH + x\,CH_2\!-\!\underset{O}{\overset{}{\diagdown\!/}}\!CHCH_3 + y\,CH_2\!-\!\underset{O}{\overset{}{\diagdown\!/}}\!CH_2 \longrightarrow RO(C_2H_4O,\ C_3H_6O)_{x+y}H$$

where R is an alkyl group having 1 to 8 carbon atoms, x and y are the number of moles of propylene oxide and ethylene oxide, respectively, and wherein ethylene oxide comprises 40 to 60 percent by weight of the combined total of ethylene oxide and propylene oxide and $x + y$ has a value to produce a molecular weight of from 500 to 850, said first finish composition being applied to the yarn prior to drawing said yarn; and

(b) a second finish composition consisting essentially of an aqueous solution of about 70 to 95 parts by weight of said mixed polyoxyethylated-polyoxypropylated monoether, about 5 to 30 parts by weight of a silane having the structural formula:



wherein $n = 2$ to 5, and a sufficient amount of a water-soluble alkaline catalyst to adjust the pH of the finish composition to 8 - 10, said second finish composition being applied as an overfinish to the yarn after drawing said yarn.

4,108,782

FOAMING AND SILT SUSPENDING AGENT

James L. Thompson, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 713,168, Aug. 10, 1976, and a continuation-in-part of Ser. No. 716,508, Aug. 23, 1976, Pat. No. 4,028,257, which is a continuation of Ser. No. 527,577, Nov. 27, 1974, abandoned. This application Apr. 27, 1977, Ser. No. 791,628

Int. Cl.[2] E21B *43/27, 43/26*

U.S. Cl. 252—8.55 C **29 Claims**

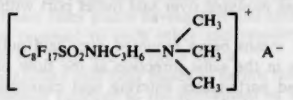
1. A composition suitable for imparting foaming and silt suspending properties to aqueous based fluids of the type suitable for use in treating subterranean formations, comprising a blend of:

(A) at least one alkyltrimethylammonium chloride, wherein the alkyl chain length is from 8 to 18 carbon atoms and the mode alkyl chain length is 12 or 14 carbon atoms;

(B) an amine oxide selected from the group consisting of bis-(2-hydroxyethyl) cocoamine oxide, dimethylhexadecylamine oxide, and dimethyl-hydrogenated tallowamine oxide;

(C) an adduct of trimethyl-1-heptanol plus seven moles of ethylene oxide; and

(D) a perfluorinated surfactant of the formula



$$\left[C_8F_{17}SO_2NHC_3H_6\!-\!\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{N}}\!-\!CH_3\right]^{+} A^-$$

wherein A^- is Cl^-, F^-, I^-, or Br^-; wherein

Components (A) and (B) are in a synergistic weight ratio to one another within the range of from about 99:1 to about 1:99;

Components (C) and (D) are in a weight ratio to one another of from about 1:1 to about 40:1, and

the combined amounts of Components (A) and (B) and the combined amounts of Components (C) and (D) in said composition are such that said composition can be diluted with an aqueous based fluid to yield a foamable fluid containing Components (A) and (B) in a combined concentration of from about 0.035 to about 0.5 weight percent and Components (C) and (D) in a combined concentration of from about 0.03 to about 0.1 weight percent.

4,108,783

HALOALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS FUEL AND LUBRICANT ADDITIVES

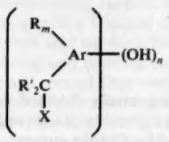
David Eugene Ripple, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 459,424, Apr. 9, 1974, abandoned. This application May 10, 1976, Ser. No. 684,818

Int. Cl.[2] C10M *1/30*

U.S. Cl. 252—54.6 **22 Claims**

1. A lubricant composition comprising a major amount of at least one lubricating oil and a minor, but engine sludge dispersing, amount of a product made by the process comprising reacting (A) at least one alpha haloalkyl hydroxy aromatic compound of the general formula



wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, X is a halogen atom, each R′ is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in both the R′ groups does not exceed 36 and (ii) where m exceeds 1, one of the R groups can also be a

group, with

(B) at least one alpha-beta olefinically unsaturated compound selected from the group consisting of $C_{2\text{-}40}$ hydrocarbyl carboxylic acids and anhydrides, esters, and amides thereof, the reaction of (A) with (B) resulting in the formation of a carbon-to-carbon bond, said bond including the carbon of at least one

group.

4,108,784

HYDROXYALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS FUEL AND LUBRICANT ADDITIVES

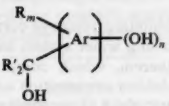
Charles Peterson Bryant, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 459,750, Apr. 9, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,101

Int. Cl.[2] C10M *1/24*

U.S. Cl. 252—56 R **22 Claims**

1. A lubricant composition comprising a major amount of at least one lubricating oil and a minor, but engine sludge dispersing, amount of a product made by the process comprising reacting (A) at least one alpha hydroxyalkyl hydroxy aromatic compound of the general formula



wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, each R′ is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in the R′ groups does not exceed 36 (ii) where m exceeds 1, one of the R groups can also be a

group, with

(B) at least one hydrocarbyl, alpha-beta olefinically unsaturated compound selected from the group consisting of C_{2-40} carboxylic acids and anhydrides, esters, and amides thereof; the reaction of (A) with (B) resulting in the formation of carbon-to-carbon bond, said bond including the carbon of at least one

group.

4,108,785

BLENDS OF MINERAL OIL AND MODIFIED TRIGLYCERIDES USEFUL FOR METAL WORKING

Robert Joseph Sturwold, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 627,852, Nov. 3, 1975, Pat. No. 4,067,817. This application Jul. 27, 1977, Ser. No. 819,649

Int. Cl.[2] C10M *1/24*

U.S. Cl. 252—56 R **7 Claims**

1. A lubricant composition comprising 0.1 to 99.5 parts by weight hydrocarbon oil having 100° F viscosity up to about 500 SUS and 0.5 to 99.9 parts of a modified triglyceride which is the reaction product of (a) 50–84 parts triglyceride derived predominantly from C_{12}–C_{18} fatty acids, (b) 2–36 parts polyoxyalkylene glycol having average molecular weight less than about 2000 and (c) 7–48 parts aliphatic or cycloaliphatic hydrocarbon dicarboxylic acid containing 18–54 carbon atoms, said reaction conducted until at least 25% reduction in acid value, based on the initial charge, is obtained.

4,108,786

MAGNETIC DRY DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Hiroshi Takayama, Moriguchi, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company Ltd., Osaka, Japan

Filed Dec. 16, 1975, Ser. No. 641,285

Int. Cl.[2] G03G *9/14*

U.S. Cl. 252—62.1 P **12 Claims**

1. A magnetic dry toner for electrostatic photography consisting essentially of spherical particles of a composition comprising a fine powder of a magnetic material having a particle size not exceeding 100 mμ and being dispersed in a binder resin, said powdery magnetic material being triiron tetroxide and being present in an amount of 25 to 75% by weight based on the composition, said binder resin being a synthetic resin which becomes adhesive upon the application of heat or pressure, said spherical particles of said composition having such a particle size distribution that particles having a particle size larger than 44 μ occupy up to 10% of the total particles and particles having a particle size smaller than 2 μ occupy up to 10% of the total particles, wherein said fine powder of the magnetic material is distributed predominantly in the surface layer portion of each spherical particle and said spherical particles have a volume resistivity not higher than 1×10^{11} Ω-cm as measured in a magnetic field of about 680 gauss under a voltage of 1000 V, and said spherical particles have such a distribution structure that the index of surface distribution (I. D.) expressed by the following formula is at least 10^2:

$$\text{I. D.} = (R_2/R_1)$$

wherein R_1 stands for a volume resistivity (Ω-cm) of said spherical particles as measured in a magnetic field of about 680 gauss under a voltage of 1000 V, and R_2 stands for a volume resistivity (Ω-cm), as measured in the same manner as above, of spherical particles formed by melting a mixture having the same composition as that of said spherical particles, blending it homogeneously and intimately in the molten state and molding the melt into particles having the same size as that of said spherical particles.

4,108,787

PROCESS FOR PRODUCING FERROMAGNETIC IRON OXIDE

Kouichi Masaki, Odawara; Teruya Shinjo, Takarazuka; Yasuo Tamai, and Tatsuji Kitamoto, both of Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Dec. 22, 1975, Ser. No. 642,826

Claims priority, application Japan, Dec. 20, 1974, 49-147089; Dec. 20, 1974, 49-147090

Int. Cl.[2] C01G *49/06*

U.S. Cl. 252—62.56 **3 Claims**

1. A process for producing ferromagnetic iron oxide containing superparamagnetic material which comprises in sequence:

(a) forming an aqueous iron (II) salt solution,

(b) neutralizing 30 to 60 wt. % of the iron (II) salt in said solution by adding an alkali to the solution at a temperature of 30° to 40° C to form a slurry of colloidal $Fe(OH)_2$ particles having dissolved therein iron (II) salt,

(c) completely oxidizing said $Fe(OH)_2$ particles to $Fe(OH)_3$ by blowing air through the colloid at a rate of 5 to 30 l/min. at 30° to 40° C,

(d) neutralizing 90 to 95% of said iron (II) salt based on the total amount of salt in the solution of step (a) at a tempera-

ture of 70° to 90° C to precipitate a layer of $Fe(OH)_2$ on said particles of step (c),

(e) completely oxidizing said layer of $Fe(OH)_2$ to $Fe(OH)_3$ by bubbling air through said slurry at a rate of 5 to 30 l/min at 70° to 90° C,

(f) completely neutralizing the remaining iron (II) said with the addition of alkali under the conditions of step (d) without bubbling air through said slurry to precipitate $Fe(OH)_2$ and effect the formation of an $Fe(OH)_3$ layer on the particles of step (e),

(g) dehydrating the particles of step (e) at a temperature of 300° to 700° C.,

(h) reducing the particles obtained in step (g) with a reducing gas at 300° to 500° C and

(i) oxidizing the particles of step (g) to a Berthollide compound or maghemite, containing superparamagnetic material.

4,108,788

LIQUID DIELECTRIC COMPOSITION DERIVED FROM THE ALKYLATION PRODUCT OF BENZENE WITH ETHYLENE

Johann G. D. Schulz, Pittsburgh; Charles M. Selwitz, and Anatoli Onopchenko, both of Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 21, 1977, Ser. No. 817,694
Int. Cl.² C10M *3/10, 3/12;* **H01B** *3/22*
U.S. Cl. 252—63 **12 Claims**

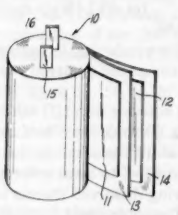
1. A liquid dielectric composition obtained as a result of a process which comprises reacting benzene with ethylene in the presence of an alkylation catalyst to obtain an alkylation product containing largely unreacted benzene, ethylbenzene, polyethylbenzenes and heavier products, separating benzene, ethylbenzene and polyethylbenzenes from said alkylation product and thereafter recovering from said heavier products by distillation while in contact with a basic material selected from the group consisting of Group I and Group II alkali metals and alkaline earth metals, their oxides and hydroxides a fraction having a boiling point in the temperature range of about 255° to about 420° C. as said liquid dielectric composition.

4,108,789

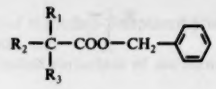
DIELECTRIC COMPOSITIONS CONTAINING BENZYL ESTERS

Pierre Jay, Saint-Didier au Mont d'Or, and Ghislain Schwachhofer, Le Mas Rillier O!-Miribel, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 716,563, Aug. 23, 1976, abandoned. This application Jun. 14, 1977, Ser. No. 806,454
Claims priority, application France, Aug. 28, 1975, 75 26954
Int. Cl.² H01B *3/20*
U.S. Cl. 252—64 **12 Claims**



1. A dielectric composition comprising a liquid mixture of at least two dielectric compounds comprising at least one benzyl ester having the formula I:



wherein:

R_1 is hydrogen or alkyl; and

R_2 and R_3 are alkyl, the total number of carbon atoms contained in R_1, R_2 and R_3 being between 3 and 20.

4,108,790

CORROSION INHIBITOR

Zisis Andrew Foroulis, Mendham, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 195,081, Nov. 2, 1971, abandoned, Ser. No. 140,125, May 4, 1971, abandoned, Ser. No. 104,477, Jan. 6, 1971, Pat. No. 3,711,246, and Ser. No. 91,612, Nov. 20, 1970, abandoned, said Ser. No. 140,125, is a continuation-in-part of Ser. No. 820,303, Apr. 29, 1969, abandoned. This application Aug. 15, 1975, Ser. No. 604,918
Int. Cl.² C23F *11/12, 11/16*
U.S. Cl. 252—175 **13 Claims**

1. A method for inhibiting oxidative corrosion of metal parts in a recirculating cooling water system having dissolved oxygen and chlorine therein, which comprises adding to said water a corrosion inhibitor composition comprised of about 30 to about 90 parts by weight of an alkali metal or ammonium gluconate and about 70 to about 10 parts by weight of a polyphosphate, wherein said added polyphosphate is selected from the group consisting of alkali metal polyphosphate and ammonium polyphosphate, the combined concentration of said gluconate and said polyphosphate being at least 25 ppm.

4,108,791

HIGH RESILIENCY POLYURETHANE FOAMS

George James Wasilczyk, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 31, 1977, Ser. No. 763,953
Int. Cl.² C08K *9/02, 3/36*
U.S. Cl. 252—182 **4 Claims**

1. A polyol containing from about 0.25 to about 10.0 percent by weight of an inorganic filler having a pH from about 6.5 to about 8, and an average effective particle size of less than 7 microns, wherein said polyol is selected from the group consisting of (A) polyether diols and triols having an average hydroxyl equivalent weight of from about 900 to about 2500, (B) polyester diols having an average hydroxyl equivalent weight of from about 900 to about 2500 and (C) mixtures thereof.

4,108,792

CALCIUM HYPOCHLORITE COMPOSITION CONTAINING MAGNESIUM AND PROCESS FOR MAKING SAME

Douglas A. Farmer, Jr., West Haven, and John A. Wojtowicz, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 25, 1977, Ser. No. 781,372
Int. Cl.² C01B *11/06;* **C11D** *3/395;* **D06L** *3/08*
U.S. Cl. 252—187 H **10 Claims**

1. In a process for the manufacture of a solid calcium hypochlorite composition wherein an aqueous slurry comprising hydrated lime is chlorinated to form an aqueous chlorinated slurry containing calcium hypochlorite and further processing said chlorinated slurry to recover a solid calcium hypochlorite composition, the improvement which comprises:

(a) employing a hydrated lime having about 97% to about 50% by weight calcium hydroxide and more than about 0.5% by weight magnesium based on the total dry weight of said hydrated lime,

(b) terminating said chlorination reaction when from about 75% to about 99.5% by weight of said calcium hydroxide is chlorinated and from 0% to about 5% by weight of said magnesium is chlorinated to form an aqueous chlorinated slurry containing substantially water-insoluble and unchlorinated magnesium compounds and calcium hypochlorite, and

(c) further processing said chlorinated slurry to remove a solid calcium hypochlorite composition having admixed therein said substantially water-insoluble and unchlorinated magnesium compounds.

4,108,793

LIQUID CRYSTAL CELL

Joseph Anthony Castellano, North Brunswick, and Michael Thomas McCaffrey, Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 40,996, May 25, 1970, abandoned. This application Oct. 29, 1973, Ser. No. 410,566

Int. Cl.[2] **G07F** *1/16*

U.S. Cl. 252—299 **8 Claims**

1. An electro-optical cell comprising a layer of a liquid crystal composition disposed between electrodes said liquid crystal composition comprising a mixture of a nematic liquid crystal compound with an optically active isomer of a compound the racemic mixture of which is nematic.

4,108,794

OIL IMMERSION LIQUID FOR FLUORESCENCE MICROSCOPES

Ken Yonekubo, Tama, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Feb. 6, 1976, Ser. No. 655,949

Claims priority, application Japan, Feb. 14, 1975, 50-18025

Int. Cl.[2] **C09K** *3/00*

U.S. Cl. 252—408 **2 Claims**

1. In a process for using a fluorescent microscope for studying materials which fluoresce in which an oil immersion objective is employed, the improvement consisting of using silicone oil having a refractive index Nd = 1.40 as the oil immersion liquid.

4,108,795

METHOD OF REGENERATING COKE-CONTAMINATED CATALYST WITH SIMULTANEOUS COMBUSTION OF CARBON MONOXIDE

Charles L. Hemler, Mt. Prospect, and Laurence O. Stine, Western Springs, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 654,260, Feb. 2, 1976, abandoned. This application Nov. 1, 1976, Ser. No. 737,358

Int. Cl.[2] **B01J** *21/20, 29/38;* **C10G** *11/04, 11/18*

U.S. Cl. 252—419 **34 Claims**

1. A method for regenerating a coke-contaminated catalyst which has become spent as a result of its use in a hydrocarbon cracking reactor with simultaneous carefully-controlled combustion of CO which comprises the steps of:

(a) introducing said coke-contaminated catalyst into a catalyst regeneration zone;

(b) passing into said regeneration zone, independently of coke-contaminated catalyst and free of the reactor feed stock and in an amount equivalent to from about 0.1 to about 30 wt. ppm of the circulating catalyst inventory on an elemental metal basis to promote the combustion of CO to CO_2, a solution comprising a CO oxidation promoter consisting essentially of noble metal compounds in a solvent selected from the group consisting of water and hydrocarbons;

(c) passing an oxygen-containing regeneration gas into said regeneration zone in an amount selected to burn coke from said coke-contaminated catalyst and to provide sufficient excess oxygen to accomplish the desired amount of CO combustion;

(d) reacting a first portion of said oxygen-containing regeneration gas with said coke-contaminated catalyst in said regeneration zone at oxidation conditions including a temperature within the range of from about 1100° F to about 1450° F and a pressure in the range of from about atmospheric to about 50 psig selected to remove coke from said coke-contaminated catalyst, to produce a flue gas containing CO and sufficient to cause combustion of CO to CO_2 in the presence of said oxidation promoter thereby producing regenerated catalyst and flue gas; and

(e) simultaneously contacting said flue gas and a second portion of said oxygen-containing regeneration gas with said CO oxidation promoter in said regeneration zone in the presence of said regenerated catalyst at said oxidation conditions, thereby (i) making a controlled quantity of exothermic heat of reaction available for operation of said regeneration zone, and (ii) decreasing the amount of CO in said flue gas to a CO concentration such that the CO_2 to CO ratio is greater than about 1.5.

17. In a process for regenerating a coke-contaminated catalyst which has become spent as a result of its use in a hydrocarbon cracking reactor wherein said coke-contaminated catalyst and an oxygen-containing regeneration gas are passed into a regeneration zone maintained at oxidizing conditions which include a temperature within the range of from about 1100° to 1450° F and a pressure in the range of from about atmospheric to about 50 psig and coke is therein oxidized to produce regenerated catalyst and flue gas containing CO_2 and CO, a method of controlling the CO concentration in said flue gas within a predetermined CO concentration range such that the CO_2 to CO ratio is greater than about 1.5 which method comprises the steps of:

(a) passing into said regeneration zone independently of said coke-contaminated catalyst and free of the reactor feed stock a first amount equivalent to from about 0.1 to about 30 wt. ppm of the circulating catalyst inventor on an elemental metal basis of a solution comprising a CO oxidation promoter selected from the group consisting of a platinum compound and a palladium compound in a solvent comprising water or a hydrocarbon compound;

(b) passing into said regeneration zone said oxygen-containing regeneration gas in an amount stoichiometrically sufficient to convert at least a portion of the CO to CO_2;

(c) converting in said regeneration zone, at conversion conditions including the presence of said CO oxidation promoter and regenerated catalyst, at least a portion of the CO to CO_2 to produce flue gas containing CO_2 and CO;

(d) analyzing said flue gas to determine a measured CO concentration and comparing said measured CO concentration with said predetermined CO concentration range; and,

(e) passing into said regeneration zone a second amount of said solution equivalent to from about 0.005 to about 10 wt. ppm of the circulating catalyst inventory on an elemental metal basis sufficient to maintain said measured CO concentration within said predetermined CO concentration range.

4,108,796

TREATMENT OF TRANSITION METAL COMPOUND

Anthony David Caunt, Welwyn Garden City; Michael Stanley Fortuin, Tarporley, and Ian Gabriel Williams, Letchworth, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 30, 1975, Ser. No. 627,451

Claims priority, application United Kingdom, Oct. 30, 1974, 46966/74

Int. Cl.[2] **B01J** *31/02*

U.S. Cl. 252—429 B **17 Claims**

1. A process for the treatment of a compound of a transition metal which comprises grinding a titanium trihalide in the

presence of from 5 up to 75% molar, relative to the titanium trihalide, of an organic Lewis Base compound which is an organo-phosphorus compound selected from the group consisting of hexamethylphosphoric triamide, N,N,N′, N′-tetramethylethyl phosphorodiamidate; N,N,N′, N′, N″-pentamethyl-N″-β-dimethylamino-ethylphosphoric triamide; 2-dimethylamino-1,3-dimethyl-1,3,2-diazaphospholidine-2-oxide octamethylpyrophosphoramide, hydrocarbyl phosphines, hydrocarbyl phosphine oxides, hydrocarbyl phosphites, and hydrocarbyl phosphates and from 1 up to 50% molar, relative to the titanium trihalide, of a titanium tetrahalide, wherein the amount of the organic Lewis Base is such as to provide at least one functional group for each molecule of the titanium tetrahalide.

4,108,797
CATALYST FOR SELF IGNITION OF FUELS

Richard E. Rice, Arlington, Mass., assignor to Comstock & Wescott, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 561,591, Mar. 24, 1975, abandoned, and a continuation-in-part of Ser. No. 601,228, Aug. 1, 1975, Pat. No. 4,047,876. This application Sep. 30, 1977, Ser. No. 838,318

Int. Cl.² B01J *21/04, 23/40*

U.S. Cl. 252—466 PT **5 Claims**

1. A catalyst for the combustion of a methanol fuel comprising:

a body of porous, fuel absorbent alumina, and an amount of one or more metals of the platinum family integrated with a major portion of the surface of said alumina, the amount of said metals integrated with said alumina being sufficient to provide a ratio of about 16 to 60% by weight of the integrated portion so that a catalyst body which has been exposed to hypernormal humidity can self-ignite said fuel.

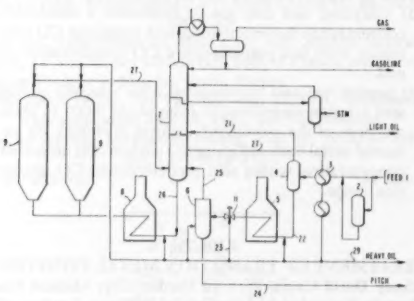
4,108,798
PROCESS FOR THE PRODUCTION OF PETROLEUM COKE

Morgan C. Sze, Upper Montclair; Thomas M. Bennett, Scotch Plains; Andre A. Simone, Parsippany, all of N.J.; Kiyoshige Hayashi, Tokyo, Japan; Mikio Nakaniwa, Ome, Japan; Nobuyuki Kobayashi, and Yoshihiko Hase, both of Ichihara, Japan, assignors to The Lummus Company, Bloomfield, N.J. and Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1976, Ser. No. 702,647

Int. Cl.² C10G *9/14, 37/02;* C10B *55/00*

U.S. Cl. 252—502 **12 Claims**



1. A process for producing high crystalline petroleum coke from a petroleum feedstock, comprising:

heat soaking a petroleum feedstock at a temperature of at least 230° C for at least 5 minutes in the presence of 30 to 200 parts per million of added dissolved sulphur in the form of at least one member selected from the group consisting of elemental sulphur, mercaptan and carbon disulfide, said petroleum feedstock being a residual heavy oil having no greater than 1.5 wt.% sulphur which is selected from the group consisting of virgin crude oil, distillation residues, cracked residues and hydrodesulfurized distillation and cracked residues;

heating the heat-soaked feedstock to effect controlled thermal cracking thereof at a pressure of no greater than 50 kg/cm²G and to a final temperature of from 450° C to 530° C;

separating non-crystalline substances as pitch to produce a pitch free feed;

recovering a heavy cokable residue from the pitch free feed;

heating said heavy cokable residue to coking temperatures; and,

subjecting the heated heavy cokable residue to delayed coking to produce high crystalline petroleum coke.

Reconsideration and allowance of this application are requested.

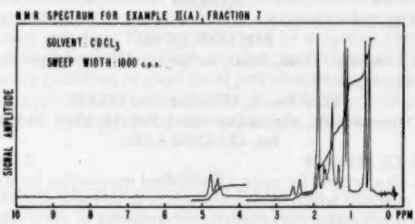
4,108,799
SUBSTITUTED ACETONAPHTHONE PERFUME COMPOSITIONS

William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

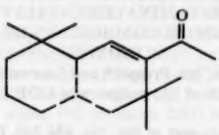
Division of Ser. No. 740,890, Nov. 11, 1976, Pat. No. 4,076,749. This application Jul. 28, 1977, Ser. No. 819,873

Int. Cl.² C11B *9/00*

U.S. Cl. 252—522 **2 Claims**



1. A perfume composition having a vetiver character comprising (i) a composition of matter consisting of a mixture of three compounds defined by the structure:



wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond in an olfactorily effective amount and (ii) at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones other than ketones contained in said mixture (i), nitriles, esters and lactones.

4,108,800
CLEANING COMPOSITION

Helmut H. Froehlich, Wilmington, Del., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 562,245, Mar. 26, 1975, abandoned. This application Dec. 30, 1976, Ser. No. 755,751

Int. Cl.² C11D *1/72*

U.S. Cl. 252—541 **3 Claims**

1. In a powdered cleaning composition comprising about from 30% to 90% particulate polymeric urea-formaldehyde and about from 10% to 70% fluid, the urea-formaldehyde

polymer having a particle size of about from 10 to about 105 microns and the fluid consisting essentially of up to 100% water containing sufficient surfactant to give a surface tension of less than 40 dynes per centimeter and up to 100% of an organic liquid selected from high boiling hydrocarbon solvents, tetrachloroethylene, methylchloroform, 1,1,2-trichloro-1,2,2-trifluoroethane, an aliphatic alcohol containing from 1 to 4 carbon atoms and mixtures of these, the improvement wherein the composition further comprises about from 0.25% to 5.0%, by weight of the cleaning composition, of a polyethylene oxide having a molecular weight of at least about 20,000 and the organic liquid comprises up to about 40% of the fluid in the composition.

4,108,801

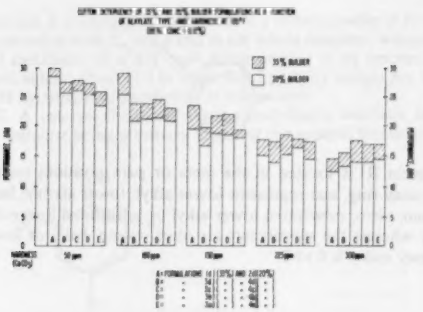
DETERGENT COMPOSITIONS AND PROCESSES UTILIZING SAME

Thomas Christ, O'Fallon, Ill., and Robert P. Langguth, Overland, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1976, Ser. No. 755,098

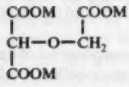
Int. Cl.[2] C11D *1/02, 3/08*

U.S. Cl. 252—544 **14 Claims**



1. A composition comprising: a. a blend of linear alkyl benzene sulfonates in approximately 1/1 ration by weight, one of said sulfonates having an average carbon number in the alkyl chain of 13–14 and a second of said sulfonates having an average carbon number in the alkyl chain of 11–12, the average carbon number in the alkyl chains of said blend being 12–13, and

b. at least 5% by weight of said blend of a compound of the formula:



wherein M is selected from the group consisting of alkali metal, ammonium, and $NH+(Ch_2CH_2OH)_3$.

4,108,802

QUATERNARY AMMONIUM POLYMERS AND PHOTOGRAPHIC MATERIALS CONTAINING SAME

Peter John Wright, Ilford, England, assignor to CIBA-GEIGY AG, Basel, Switzerland

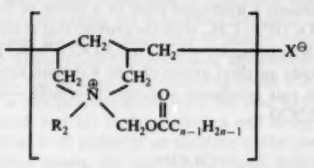
Filed May 20, 1976, Ser. No. 688,516

Claims priority, application United Kingdom, Jun. 4, 1975, 24131/75

Int. Cl.[2] C08F *22/40, 26/02*

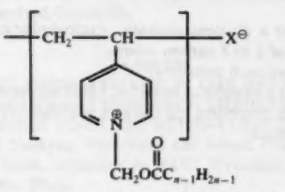
U.S. Cl. 526—17 **8 Claims**

1. A polymeric material which comprises repeating units of the formulae



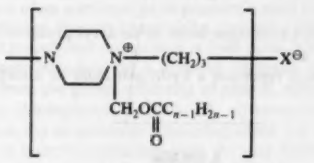
(A)

wherein R_2 is alkyl of 1 to 7 carbon atoms, X is a chloride or bromide anion and *n* is an integer of 1 to 15,



(B)

wherein X is a chloride or bromide anion and *n* is an integer of 1 to 15, or



(C)

wherein X is a chloride or bromide anion and *n* is an integer of 1 to 15.

4,108,803

PHOTOPOLYMERIZABLE EPOXY RESINS CONTAINING PENDANT UNSATURATED ESTER OR AMIDOMETHYL GROUPS

George Edward Green, Stapleford, and John Sidney Waterhouse, Cherry Hinton, both of England, assignors to Ciba-Gligy Corporation, Ardsley, N.Y.

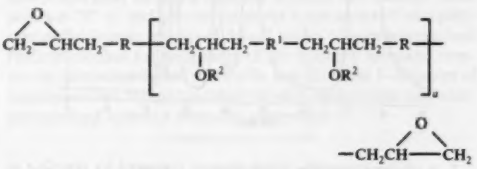
Filed Mar. 10, 1977, Ser. No. 776,446

Claims priority, application United Kingdom, Mar. 23, 1976, 11598/76; Jul. 16, 1976, 29792/76

Int. Cl.[2] C08G *59/16*

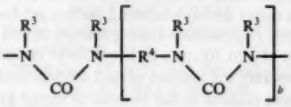
U.S. Cl. 96—76 R **7 Claims**

1. Epoxide resins of the formula



where

a is an integer of average value of at least 1 and at most 100, each R and R^1 represents a group of formula



or —O—$(OC)_c$—R^5—$(CO)_c$—O—,

each R^2 represents a hydrogen atom or a group of formula —$(CH_2NH)_aCOC(R^6)$=CH_2, with the proviso that at least 1 of the 2*a* groups R^2 represents —$(CH_2NH)_aCOC(R^6)$=CH_2,

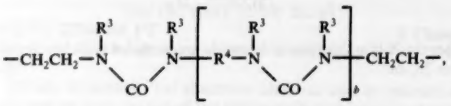
each R^3 denotes an alkyl group of 1 to 4 carbon atoms, or conjointly each pair represents a group of formula —CH_2CH_2—, —$C(R^7R^8)CO$—,

—$CH_2CH_2CH_2$—, —COCO—, —COCOCO—, or —$COC(OH)_2CO$—,

R^4 represents a divalent aliphatic, cycloaliphatic, or araliphatic radical of 1 to 8 carbon atoms,

b, *c*, and *d* are each zero or 1,

R^5 represents a straight or branched chain aliphatic group of 2 to 20 atoms or, providing *c* is 1, it may alternatively represent a group of formula



R^6 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, and

R^7 and R^8 each represent a hydrogen atom or a methyl or ethyl group.

4,108,804

PROCESS FOR PREPARATION OF CHROMATOGRAPHY SOLID SUPPORTS COMPRISING A NUCLEIC ACID BASE-EPOXY GROUP CONTAINING POROUS GEL

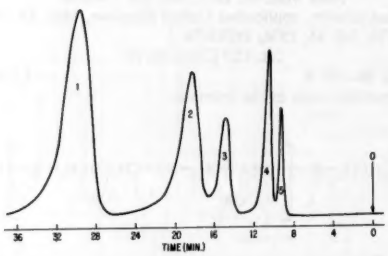
Toru Seita; Akihiko Shimizu; Yoshio Kato, and Tsutomu Hashimoto, all of Shin-nanyo, Japan

Filed Nov. 29, 1976, Ser. No. 745,767

Claims priority, application Japan, Dec. 23, 1975, 50-152860; Dec. 27, 1975, 51-157879

Int. Cl.² C08L *5/00*

U.S. Cl. 521—121 **9 Claims**



1. A chromatography solid support prepared by reacting at a temperature of 50° to 200° C a nucleic acid base, a related compound thereof or a mixture thereof, selected from a group consisting of adenine, guanine, thymine, uracil, cytosine, theophylline, hypoxanthine, 6-mercaptopurine and 5-halopyrimidine, with an epoxy group-contaning porous gel having a pore size of less than 1mμ, a cross-linking density of 5 to 30 mole % and a gel size of 2 to 200 mμ, in a solvent in the presence of a carbonate, wherein the amount of said nucleic acid base is 0.4 to 3 equivalents relative to the number of epoxy groups in the porous gel, and the carbonate is present in an amount of 1 to 30 mole % based on the number of epoxy groups in the porous gel.

4,108,805

STRUCTURALLY REGULATED POLYPHOSPHAZENE COPOLYMERS

Ronald L. Dieck, Evansville, Ind., and Edwin J. Quinn, Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Sep. 6, 1977, Ser. No. 830,692

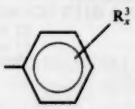
Int. Cl.² C08G *79/02*

U.S. Cl. 521—180 **21 Claims**

1. A structurally regulated polyphosphazene copolymer represented by the general formula

—$N_3P_3(Cl_2)(OR^1)$—$_n$

where *n* is greater than 2 to about 600 and where R^1 represents



wherein R^3 is located in the meta or para positions on the phenoxy ring, and represents lower alkyl, lower alkoxy, halo, cyano, nitro, substituted lower alkyl or substituted lower alkoxy wherein the substituents are nitro, cyano, halo, or lower alkoxy and *x* is 0 to 3.

4,108,806

THERMOPLASTIC EXPANDABLE MICROSPHERE PROCESS AND PRODUCT

William E. Cohrs, Midland, and Roland E. Gunderman, Clare, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 205,289, Dec. 6, 1971, abandoned. This application Dec. 21, 1973, Ser. No. 427,298

Int. Cl.² B01F *15/00*

U.S. Cl. 521—54 **7 Claims**

1. A process for the incorporation of expandable thermoplastic synthetic resinous monocellular microspheres having a thermoplastic resinous shell, a volatile liquid foaming agent therein within a heat plastifiable matrix material which, at its heat plastification temperature does not act as a rapid solvent for the microspheres to cause the destruction thereof by solvent action or heat plastify at a temperature sufficiently high that the microspheres are destroyed by thermal degradation, the steps of the method comprising

admixing the microspheres and matrix forming material,

heat plastifying the matrix material and

mechanically working the mixture to form a matrix about the microspheres without causing expansion thereof, subsequently

passing the mixture into a zone of lower pressure wherein the microspheres expand to form a plurality of hollow, generally monocellular particles within the matrix, and

cooling the mixture below the heat plastifying temperature.

4,108,807

ORGANO-METALLATE POLYMERS AND PROCESSES FOR THE MANUFACTURE THEREOF

Karl Heinz Hilterhaus, Georgsmarienhütte, and Franz Gottfried Reuter, Lemförde, both of Fed. Rep. of Germany, assignors to Chemie-Anlagenbau Bischofsheim GmbH, Osnabruck; Reuter Technologie GmbH, Lemforde and Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, all of, Fed. Rep. of Germany

Filed Jul. 19, 1976, Ser. No. 706,199

Claims priority, application United Kingdom, Jul. 18, 1975, 30303/75

Int. Cl.[2] C08G *18/18, 18/38*

U.S. Cl. 521—118 18 Claims

1. A method of making an organo-metallate polymer comprising reacting, in liquid phase, a mixture containing:

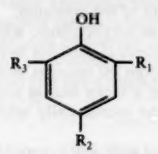
A. A pseudohalide compound selected from the group consisting of organic isocyanates and thioisocyanates having at least two isocyanate or thioisocyanate groups, and organic thiocyanates and selenocyanates having at least two thiocyanate or selenocyanate groups

B. An aqueous alkaline solution of a metallate comprising a soluble salt of a compound having the formula

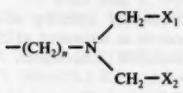
$$H_n(MeX_m)$$

in which X is oxygen or sulfur, Me is a metal capable of forming an anion with X, and *n* and *m* are whole numbers, whereby said metallate; on a dry basis being present in an amount of about at least about 17.5 to about 210.5 parts by weight per 100 parts by weight of pseudohalide compound,

C. A catalyst for catalyzing a pseudohalide reaction, said catalyst being a tertiary amine of the general formula:



in which formula the radicals R_1, R_2 and R_3, which may be the same or different, each represents a hydrogen atom or a radical of the general formula:



in which *n* is an integer of from 1 to 25 and the radicals X_1 and X_2, which may be the same or different, each represents a hydrogen atom or an alkyl radical having 1 to 25 carbon atoms and which may be substituted by primary and/or secondary hydroxyl groups, at most two of the radicals R_1, R_2 and R_3 being hydrogen atoms.

16. A process according to claim 1 wherein the reaction is carried out in the presence of a blowing agent.

4,108,808

NOVEL OXYALKYLATED POLYOL PREPOLYMERS, FLAME RETARDANT INTERPOLYMERS PREPARED THEREFROM, AND PROCESSES FOR THE PREPARATION THEREOF

Thirumurti Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 26, 1976, Ser. No. 745,049

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—181 56 Claims

15. A rigid cellular interpolymer prepared by curing a reactive liquid oxyalkylated polyol prepolymer in the presence of a foaming agent and an acid catalyst, the said oxyalkylated polyol prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1–8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol and being oxyalkylated with about 1–10 moles of an alkylene oxide containing about 2–4 carbon atoms, the said oxyalkylated polyol prepolymer having a viscosity of about 1000–500,000 centipoises at 25° C. and containing about 1.1–6 moles of interpolymerized aldehyde and about 3.1–15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith.

4,108,809

NOVEL PREPOLYMERS, FLAME RETARDANT INTERPOLYMERS PREPARED THEREFROM, AND PROCESSES FOR THE PREPARATION THEREOF

Thirumurti Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 29, 1976, Ser. No. 745,628

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—136 63 Claims

1. A reactive liquid composition which may be cured in the presence of an acid catalyst to produce a rigid flame retardant interpolymer, the said composition consisting essentially of (1) a liquid prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1–8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol, the said prepolymer having a viscosity of about 100–500,000 centipoises at 25° C, and containing about 1.1–6 moles of interpolymerized aldehyde and about 3.1–15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith, and (2) about 1–10 moles of unpolymerized furfuryl alcohol for each mole of the said interpolymerized hydroxy aromatic compound.

15. A rigid flame retardant cellular interpolymer prepared by curing a reactive liquid composition in the presence of a foaming agent and an acid catalyst, the said composition consisting essentially of (1) a liquid prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1–8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol, the said prepolymer having a viscosity of about 100–500,000 centipoises at 25° C. and containing about 1.1–6 moles of interpolymerized aldehyde and about 3.1–15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith, and (2) about 1–10 moles of unpolymerized furfuryl alcohol for each mole of the said interpolymerized hydroxy aromatic compound.

4,108,810

METHOD FOR MAKING CROSSLINKED RESIN FOAMS FROM AT LEAST ONE DICARBOXYLIC ACID, AT LEAST ONE ETHYLENICALLY UNSATURATED DICARBOXYLIC ACID ANHYDRIDE AND A POLYISOCYANATE

Ann Marie Baker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1977, Ser. No. 843,015

Int. Cl.[2] C08J *9/00, 9/08*

U.S. Cl. 521—129 10 Claims

1. In a method of making crosslinked ethylenic polymer

resin foams, the improvement which comprises making a storage-stable foamable solid intermediate by admixing and interacting in a reaction mixture at temperature above the melting point thereof but below about 100° C, at least one organic polyisocyanate, at least one dicarboxylic acid, and at least one ethylenically unsaturated dicarboxylic acid cyclic anhydride, allowing carbon dioxide to evolve from the reaction mixture, subsequently adding to the reaction mixture a pre-combined mixture of catalyst and surfactant, subsequently adding to the reaction mixture a small amount of water, maintaining the reaction mixture at temperature below about 100° C until the reaction mixture begins to harden, then cooling the reaction mixture to solid state.

4,108,811

COMPOSITION PROCESS FOR AQUEOUS BASE COATINGS FOR CORRODIBLE METALS

Paul Sheppard Eckhoff, Melville, N.Y., assignor to International Minerals & Chemical Corp., Libertyville, Ill.

Continuation-in-part of Ser. No. 382,040, Jul. 23, 1973, Pat. No. 3,919,145, and Ser. No. 615,067, Sep. 19, 1975, abandoned. This application Dec. 2, 1976, Ser. No. 747,015

Int. Cl.² C09D *3/66, 3/72*

U.S. Cl. 260—22 TN **30 Claims**

1. A water base latex composition for coating corrodible surfaces consisting essentially of (1) an aqueous resin binder formed by blending an aqueous dispersion of a film-forming polymer selected from the group consisting of acrylic and vinyl acetate polymers and (2) an aqueous alkaline emulsion of a polyurethane resin, wherein said polyurethane resin is the reaction product of a diisocyanate with an hydroxylic oil-modified resin intermediate, wherein said intermediate is (a) the alcoholysis product of a synthetic or natural drying oil or semi-drying oil and one or more polyhydric alcohols or (b) the reaction product of one or more polyhydric alcohols and one or more acids selected from the group consisting of monomeric and polymeric drying and semi-drying fatty acids.

4,108,812

AQUEOUS PRINTING INKS

Erwin Grueninger, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

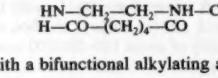
Filed Dec. 1, 1975, Ser. No. 636,815

Claims priority, application Sweden, Dec. 5, 1974, 7416159

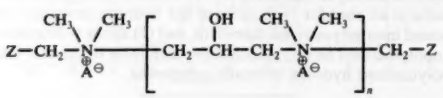
Int. Cl.² B32B *21/06;* **C09D** *11/02;* **D21C** *5/02*

U.S. Cl. 260—24 **14 Claims**

1. A storage-stable aqueous printing ink comprising (1) an anionic dyestuff, (2) a cationic fixing agent which is a hydrosoluble polymer produced by cross-linking a polyamide amine containing the functional groups of formula



with a bifunctional alkylating agent of formula



where $A^{\oplus}$ is an anion,
n is 0 to 3, and
Z is

or —CH(OH)—CH_2Cl in such proportions that all epoxy or halogenohydrin groups in the crosslinking agent capable of effecting alkylation are reacted without producing a water-insoluble product, and (3) a sufficient amount of ammonia or a volatile amine to inhibit premature reaction between said cationic fixing agent and said anionic dyestuff.

4,108,813

CEMENTITIOUS FLOORING COMPOSITION CONTAINING MIXTURE OF INTERMESHING PARTICLES OF SUBSTANTIALLY SPHERICAL QUARTZ SAND

Albert Lee Roberts, 4309 Paseo De Las Tortugas, Torrance, Calif. 90505

Filed Dec. 17, 1973, Ser. No. 425,274

Int. Cl.² C08L *31/02*

U.S. Cl. 260—29.6 S **20 Claims**

1. A cementitious composition suitable for spray application in the formation of a dense floor structure, said composition consisting essentially of:

about 58 to about 70 percent by weight of a mixture of intermeshing particles of substantially spherical quartz sand;

said mixture including a weight fraction of relatively large size particles and a weight fraction of relatively small size particles;

the weight ratio of the relatively large size particles with respect to the relatively small size particles ranging from about 3:1 to about 1:1 and the ratio of the average diameter of the relatively large size particles with respect to the average diameter of the relatively small size particles ranging from about 2:1 to about 3:1;

a finely ground Portland cement;

a plastic-in-water emulsion having a solids content of about 20 to about 50 percent by weight of the emulsion;

the plastic in sand emulsion being an acrylic plastic which is present in the form of minute spherical particles having a particle size of about 0.05 to about 50 microns and said plastic being capable of forming a tacky film at ambient temperatures and bonding to the substantially spherical quartz sand;

a flow control material in an amount sufficient to provide the composition with laminar flow properties during spray application;

said composition having a low water-to-cement ratio in the range of about 0.4 to about 0.5, **with the water being furnished by said emulsion and**

said composition having a Brookfield viscosity of about 2,000 to about 5,000 centipoisers as measured at 20 rpm with a Brookfield Synchroelectric Viscometer, Model LVF, using a number 3 spindle,

whereby said composition may be sprayed onto a generally horizontal support surface in the formation of a dense floor structure having a low void content and being substantially free from surface cracking or crazing and with the composition being sufficiently fluid to provide flow and leveling after application to the support surface.

4,108,814

AQUEOUS POLYURETHANE DISPERSIONS FROM SOLVENT-FREE PREPOLYMERS USING SULFONATE DIOLS

Helmut Reiff, New Martinsville, W. Va.; Wolfgang Wenzel, Leverkusen; Jürgen Grammel, Cologne, and Dieter Dieterich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 614,730, Sep. 18. 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,206

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1974, 2446440

Int. Cl.² C08G *18/12, 18/38, 18/84*

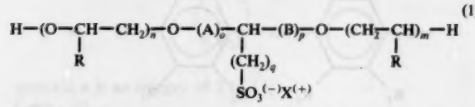
U.S. Cl. 260—29.2 TN **9 Claims**

1. A process for preparing water soluble polyurethanes comprising

a. forming a prepolymer in the absence of solvent at temper-

atures between about 30° and 120° C and an NCO to OH ratio of between about 1.05 and 6 by reacting

i. sulphonate containing diols having a melting point or softening point below 120° C of the general formula



(1)

wherein

A and B, which may be the same or different, each represents a divalent aliphatic hydrocarbon group containing from 1 to 6 carbon atoms,

R represents hydrogen, an aliphatic hydrocarbon group containing 1 to 4 carbon atoms or a phenyl group,

$X^{(+)}$ represents an alkali metal cation or when $n + m > 0$ or when $q \neq 1$ an ammonium group which may be substituted.

n and *m*, which may be the same or different, each represents an integer between 0 and 30 inclusive

o and *p* represent 0 or 1, and

q represents an integer of from 0 to 2 with,

ii. polyisocyanates of the formula

(2) $Q(NCO)_2$ wherein

Q represents C_4 to C_{12} alkyl, C_6 to C_{15} cycloalkyl, C_6 to C_{15} aryl or C_7 to C_{15} aralkyl, and

iii. dihydroxy compounds having molecular weights of about 1000 to 6000 selected from the group consisting of polyesters, polyethers, polythioethers, polyacetals, polycarbonates or polyester amides, and

b. chain extending the prepolymer with water and water soluble diamines having molecular weights of about 32 to 600 and exclusively primary or secondary amino groups the proportion of reactants being so selected that the final polymer has a sulphonate group content of about 0.1 to 6 wt. %.

4,108,815

HEAT-CURABLE LACQUER OF LOW SOLVENT CONTENT, BASED ON AN EPOXIDE RESIN

Thaddeus Audykowski, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,963

Claims priority, application Switzerland, Aug. 16, 1974, 11256/74

Int. Cl.² C08K *5/09, 5/10;* **C08L** *63/00*

U.S. Cl. 260—29.2 EP **15 Claims**

1. A heat-curable lacquer of low solvent content, characterized in that it contains

(A) from 90–10% by weight of a compound having two or more glycidyl groups; and

(B) from 10–90% by weight of a solution containing 50–95% by weight of 4,4'-(2-acetoxy-1,3-glyceryl)di-anhydrotrimellitate or the corresponding tetracarboxylic acid of said di-anhydrotrimellitate.

4,108,816

CROSS-LINKABLE EMULSIFYING AGENTS AND AQUEOUS EMULSIONS CONTAINING THE SAME

George L. Brown, Scotch Plains, and Albert C. Chen, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 606,811, Aug. 22, 1975, abandoned. This application Aug. 19, 1977, Ser. No. 827,777

Int. Cl.² C08L *61/28, 63/00*

U.S. Cl. 260—29.4 R **5 Claims**

1. A thermally cross-linkable emulsifying agent consisting essentially of the transetherification reaction product of a polyoxyethylene glycol having a molecular weight in the range of from about 1,000 to about 20,000, with an excess of aminoplast resin sufficient to enable one molecule of the aminoplast resin to be reacted onto each end of the glycol, said aminoplast resin being etherified with methanol and said transetherification reaction being carried out at a temperature of from 100°–120° C. in the presence of an acid catalyst while removing alcohol.

4,108,817

AUTODEPOSITED COATINGS

Frank P. Lochel, Jr., Lansdale, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Dec. 30, 1976, Ser. No. 755,921

Int. Cl.² C23F *7/00*

U.S. Cl. 260—29.6 E **15 Claims**

2. An autodepositing composition containing solid resin particles and of the type which is effective in forming on a metallic surface an autodeposited resinous coating by dissolving metal ions from the metal surface in amounts which cause the resin particles to deposit on the surface in a manner such that there is a continuous buildup of organic coating having combined therewith an acid inhibitor soluble in said composition in an amount effective to reduce or prevent the tendency of said composition to form coatings which have defects such as pinholes, blisters, craters or bridges said amount being less than that amount which substantially deters or prevents said composition from forming an autodeposited coating or an autodeposited coating having the desired thickness.

4,108,818

PROCESS FOR THE MELT-SHAPING OF ACRYLONITRILE POLYMERS

Kenji Odawara, and Shoichi Takeuchi, both of Okayama, Japan, assignors to Japan Exlan Company Limited

Filed Mar. 2, 1976, Ser. No. 663,281

Claims priority, application Japan, Mar. 3, 1975, 50-26283

Int. Cl.² C08L *33/20, 51/00*

U.S. Cl. 260—29.6 AQ **7 Claims**

1. A process for the melt-shaping of acrylonitrile polymers, characterized in that an acrylonitriie polymer composition consisting essentially of acrylonitrile polymer, water and acrylonitrile which is obtained by uniformly mixing 30 – 90 weight percent of an acrylonitrile polymer, 1 – 56 weight percent of water and 2 – 63 weight percent of acrylonitrile is heated at the autogeneous pressure or above, and the melt is shaped into a desired form.

4,108,819

PROCESS FOR PRODUCING AN AQUEOUS DISPERSION OF VINYL ACETATE-ETHYLENE COPOLYMER INCLUDING AN EPOXIDE COMPOUND

Takeo Oyamada; Shinobu Tsuru; Choji Tomizawa, all of Ichihara, and Yoshito Taira, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 648,659, Jan. 13, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 790,062

Claims priority, application Japan, Jan. 14, 1975, 50-6599; Jul. 16, 1975, 50-87528

Int. Cl.² C08L *63/10, 31/02*

U.S. Cl. 260—29.6 NR **22 Claims**

1. A process for producing an aqueous dispersion of vinyl acetate-ethylene copolymer containing an epoxide resin, which comprises emulsion-polymerizing vinyl acetate, wherein at least one epoxide resin having at least two epoxy groups per molecule is dissolved therein, and ethylene at a pH value of 3 to 7, so that the ratio of vinyl acetate and ethylene is in the range of 60–95: 40–5 by weight and the content of the epoxide resin is in the range of 0.5 to 60% by weight, based on the total weight of the solid resin components.

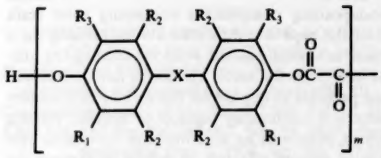
4,108,820

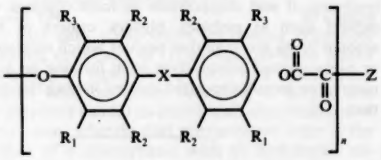
POLYCARBONATE COMPOSITION CONTAINING OLIGOMERIC-POLYMERIC OXALATE PLASTICIZER

Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1976, Ser. No. 748,470
Int. Cl.[2] C08K 5/36
U.S. Cl. 260—30.8 R **8 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an oligomeric-polymeric oxalate of the following formula:

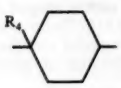




wherein R_1 is independently selected from the group consisting of hydrogen, halogen or C_1 to C_{12} alkyl; R_2 is independently selected from the group consisting of hydrogen or C_1 to C_5 alkyl; R_3 is independently selected from the group consisting of hydrogen, halogen or C_1–C_2 alkyl; X is selected from the group consisting of:

(a)

wherein A is



and R_4 is hydrogen or C_1–C_4 alkyl; R is independently selected from the group consisting of hydrogen, C_1–C_{15} alkyl, aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C_1–C_5 alkyl;

$-CH_2CH_2-$ (b)

$-CH_2B-CH_2-$ (c)

wherein B is C_1–C_{16} alkylene or arylene of 6 to 14 carbon atoms;

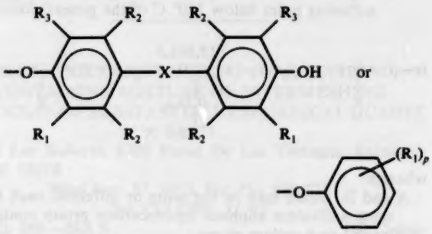
(d)

wherein *a* is an integer of 3 to 15;

—O— (e)

—S— (f)

m and *n* are integers from 0 to 80 provided the sum of *m* and *n* is at least 2; and Z is

 or

wherein R_1, R_2, R_3 and X are as previously defined; *p* is an integer of 0–5.

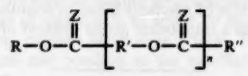
4,108,821

POLYCARBONATE COMPOSITION CONTAINING IMINATED AND THIONATED CARBONATE PLASTICIZERS

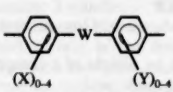
Victor Mark, Evansville, Ind., and Phillip Steven Wilson, Louisville, Ky., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1976, Ser. No. 748,467
Int. Cl.[2] C08K 5/41, 5/29
U.S. Cl. 260—30.8 R **7 Claims**

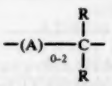
1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of an organic plasticizer of the following formula:



wherein R and R" are independently selected from the group consisting of C_1 to C_{30} alkyl, aryl of 6 to 14 carbon atoms and substituted aryl wherein the substituents are C_1 to C_{30} alkyl, halogen, C_1 to C_{30} alkoxy, aryloxy of 6 to 14 carbon atoms, alkythio of 1 to 30 carbon atoms, arylthio of 6 to 14 carbon atoms, R' is selected from the group consisting of C_1 to C_{30} alkylene, arylene of 6 to 14 carbon atoms, alkarylene of 7 to 30 carbon atoms, aralkylene of 7 to 30 carbon atoms and



wherein W is selected from the group consisting of:

 (a)

wherein A is

and R_4 is hydrogen or C_1–C_4 alkyl; R is independently selected from the group consisting of hydrogen, C_1–C_{15} alkyl, aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C_1–C_5 alkyl;

(b) $-CH_2CH_2-$

(c) $-CH_2B\text{-}CH_2-$

wherein B is C_1–C_{16} alkylene or arylene of 6 to 14 carbon atoms;

wherein a is an integer of 3 to 15;

(e) —O—;

(e) —S—;

X and Y are independently selected from the group consisting of halogen and C_1–C_{12} alkyl; Z is =S or =N—R_5, wherein R_5 is C_1–C_{30} alkyl, aryl of 6 to 12 carbon atoms, or substituted aryl wherein the substituents are C_1–C_{15} alkyl or halogen; *n* is 0 or 1.

4,108,822

CURABLE RESIN COMPOSITIONS

Alfred Gerald Edwards, Stourport-on-Severn, and Glyn Islwyn Harris, Hagley, both of England, assignors to Albright & Wilson Ltd., Warley, England

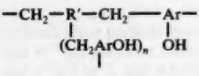
Continuation-in-part of Ser. No. 431,828, Jan. 9, 1974, Pat. No. 3,923,721. This application Aug. 13, 1975, Ser. No. 604,434

Claims priority, application United Kingdom, Apr. 16, 1975, 14620/75

Int. Cl.² C08G *61/28, 61/24*

U.S. Cl. 260—32.8 R **21 Claims**

1./ A resin composition which comprises (a) a resin having repeating units of the formula



wherein R′ is selected from the group consisting of divalent and trivalent aromatic hydrocarbyl groups and divalent and trivalent di(aromatic hydrocarbyl)oxy groups, and Ar is a residue formed by removal of two nuclear hydrogen atoms from a phenolic compound having 1–3 hydroxyl groups and at least two nuclear hydrogen atoms, and *n* is 0 or 1, and (*b*) a condensate in an amount of 15%-35% by weight (based on the total weight of resin and condensate), said condensate being (i) derived from formaldehyde and melamine and (ii) capable of reacting with said resin (a) to form a cured product, and said resin composition being in an uncured or or partially cured form.

4,108,823

COMPOSITION FOR COMPENSATING INSUFFICIENT ADAPTATION OF DENTURE BASE

Masakiyo Yoshimura, and Yasukazu Yamaguti, both of Osaka, Japan, assignors to Shionogi & Co., Ltd. and Kabushiki Kaisha Kyowa, both of, Japan

Filed Dec. 15, 1977, Ser. No. 860,957

Claims priority, application Japan, Dec. 18, 1976, 51-152618

Int. Cl.² C08K *5/05*

U.S. Cl. 260—33.4 PQ **2 Claims**

1. A composition for compensating the insufficient adaptation of a denture base to the ridges on the jaws or the palate, which comprises polyvinyl acetate, polybutene and ethanol in a weight proportion of 65 - 85 : 2 - 7 : 10 - 35.

4,108,824

LOW-TEMPERATURE CURABLE SATURATED EPOXY RESIN COMPOSITIONS

(d) **Mark F. Dante, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

Filed Jul. 11, 1977, Ser. No. 814,369

Int. Cl.² C08G *59/02*; C08K *5/05, 5/15*

U.S. Cl. 260—33.2 EP **7 Claims**

1. A curable composition prepared by reacting a saturated epoxy resin with a curing amount of an aliphatic amine for from about 15 to 60 minutes in the presence of an organic solvent selected from the group consisting of aliphatic alcohols, glycols, and glycol ethers, and wherein the weight ratio of the epoxy resin - amine adduct to organic solvent is from 25:75 to 95:5.

4,108,825

FLAME RETARDANT HEAT-CURABLE SILICONE COMPOSITIONS CONTAINING CERIC HYDRATE

William R. Hayes, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 774,830, Mar. 7, 1977, abandoned. This application Jan. 13, 1978, Ser. No. 869,336

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **12 Claims**

1. A silicone composition curable to a flame retardant elastomer comprising a product obtained by mixing

(a) 100 parts by weight of a triorganosiloxy endblocked polydiorganosiloxane fluid wherein each organic radical is selected from a group consisting of methyl, ethyl, vinyl, phenyl, and 3,3,3-trifluoropropyl radicals, there being an average of 2 vinyl radicals per molecule and only one vinyl radical bonded to any one silicon atom, there being from 0 to 50 inclusive percent 3,3,3-trifluoropropyl radicals based on the total number of organic radicals in the polydiorganosiloxane fluid, there being from 0 to 10 inclusive percent of phenyl radicals based on the total number of organic radicals in the polydiorganosiloxane fluid, the fluid having a viscosity of from 0.2 to 30 Pa·s measured at 25° C.,

(b) an organohydrogensiloxane having an average of at least 2.1 silicon-bonded hydrogen atoms per molecule, no silicon atom having bonded thereto more than one silicon-bonded hydrogen atom, said molecules consisting essentially of units selected from the group consisting of $H(CH_3)SiO$ units, R_2SiO units, $H(CH_3)_2SiO_{\frac{1}{2}}$ units, and $R_3SiO_{\frac{1}{2}}$ units, R being selected from the group consisting of alkyl radicals having from 1 to 6 carbon atoms inclusive, phenyl and 3,3,3-trifluoropropyl radicals, the amount of organohydrogensiloxane being sufficient to provide from 1.2 to 3 inclusive silicon-bonded hydrogen atoms for every silicon-bonded vinyl group in the polydiorganosiloxane fluid,

(c) from 5 to 100 parts by weight of a reinforcing silica filler having a surface area of at least 50 square meters per gram and having the surface thereof treated with an organosilicon compound to control crepe-aging of the curable silicone composition so that the viscosity does not rise above 250 Pa·s at 25° C. during the shelf life of the composition,

(d) a platinum catalyst, soluble in (a), and providing at least 1 part by weight of platinum for every one million parts by weight of the polydiorganosiloxane fluid (a), and

(e) from 0.1 to 3 parts by weight of ceric hydrate wherein the cerium atoms are in the tetravalent state, the other atoms of the compound are hydrogen atoms and oxygen atoms, said hydrogen atoms are present as —OH radicals, H_2O molecules or both, and said hydrogen atoms are present in an amount, determined as H_2O molecules, from 1 to 10 weight percent inclusive based on the total weight of ceric hydrate.

4,108,826

FURFURYL ALCOHOL-HEXAALKOXYMETHYLMELAMINE FOUNDRY BINDERS

Hugh C. Anderson, Palatine, and Russell B. Lembke, Crystal Lake, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jun. 20, 1977, Ser. No. 808,022
Int. Cl.[2] C08K *3/36, 7/14*
U.S. Cl. 260—395 B **15 Claims**

1. A composition comprising a mixture of monomeric furfuryl alcohol and hexaalkoxymethylmelamine, in which the hexaalkoxymethylmelamine is present in an amount sufficient to provide from 2 to 40 percent by weight based on the weight of the mixture.

4,108,827

COLORLESS ALLYL DIGLYCOL CARBONATE

Norman U. La Liberte, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 13, 1976, Ser. No. 749,901
Int. Cl.[2] C08K *5/56*
U.S. Cl. 260—42.21 **11 Claims**

1. An optically clear, colorless, ophthalmic quality lens comprising about 16 parts allyl diglycol carbonate and between about 0.05 and 0.15 parts of a composition comprising 40 parts of a member selected from the group consisting of maleic anhydride, maleic acid, the products of reaction of propylene glycol, ethylene glycol, and glycerin with maleic anhydride or maleic acid, and mixtures thereof, and between about 0.5 and 1.5 parts of a mixture consisting essentially of 10 parts cobalt acetyl acetonate and between 0.4 and 1.2 parts copper acetyl acetonate.

4,108,828

POLYLACTAM COMPOSITION CONTAINING HEXAORGANO DISTANNANE

Jean W. Bouchoux, Nutley, and William A. Larkin, Morristown, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Division of Ser. No. 430,690, Jan. 4, 1974, Pat. No. 3,954,738.
This application Jun. 16, 1975, Ser. No. 586,960
The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.
Int. Cl.[2] C08K *5/57;* C08G *69/14*
U.S. Cl. 260—45.75 H **4 Claims**

1. In a fiber-and film-forming lactam polymer composition which contains between 0.05 and 5%, based on the weight of said polymer, of an alkali metal salt of said lactam, the improvement which resides in the presence in said composition of between 0.5 and 100%, based on the weight of said alkali metal salt, of a hexaorgano distannane exhibiting the formula $R_3^2SnSnR_3^3$, wherein R^2 and R^3 are each selected from the group consisting of alkyl radicals containing between 1 and 20 carbon atoms.

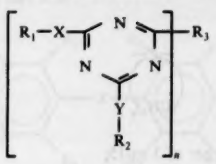
4,108,829

PIPERIDYL-TRIAZINE DERIVATIVES AS STABILIZERS FOR SYNTHETIC POLYMERS

Paolo Cassandrini, Bologna, and Antonio Tozzi, Sasso Marconi, both of Italy, assignors to Chimosa Chimica Organica S.p.A., Pontecchio Marconi, Italy

Filed Jun. 23, 1976, Ser. No. 699,163
Claims priority, application Italy, Dec. 18, 1975, 52769 A/75
Int. Cl.[2] C08K *5/34;* C07D *251/26*
U.S. Cl. 260—45.8 NT **24 Claims**

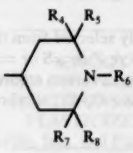
1. A method of increasing the light stability of a synthetic polymer, comprising adding to a composition of material of said synthetic polymer, an amount of a compound having the formula



(I)

wherein

R_1, R_2, same or different, are hydrogen, hydroxyl, straight or branched chain C_1 to C_{18} alkyl, C_5 to C_{18} cycloalkyl, substituted or not substituted C_6 to C_{18} aryl, C_7 to C_{18} aralkyl or a piperidine radical of formula (II)



(II)

in which R_4, R_5, R_7, R_8, same or different, are selected from C_1 to C_6 alkyl and R_6 is selected from H, O, C_1 to C_{12} alkyl, C_2 to C_{12} alkenyl or alkinyl,

a group

in which R_9, R_{10}, same or different,

are selected from hydrogen, a C_1 to C_8 alkyl, a C_5 to C_8 cycloalkyl or a C_6 to C_8 aryl;

X, Y, same or different, are —O—, —S— or

R_{11} being selected from H, a straight or branched chain C_1 to C_{18} alkyl, C_5 to C_{18} cycloalkyl, C_6 to C_{18} aryl, C_7 to C_{18} aralkyl or a piperidine radical of formula (II);

the radicals R_1—X—, R_2—Y—, taken as a single substituent group representing a radical of a nitrogenous heterocyclic compound having 5 to 8 atoms linked to the triazine ring by means of a distributed nitrogen atom of said radical, as well as representing Cl— and Br—;

n is an integer from 2 to 6;

R_3 is an n-valent residue derived from a polyalcohol, a polymercaptan or a polyamine by reaction of the active H atoms thereof with a halogen atom of a monohalogen triazine;

in the formula (I) there is in at least one of the radicals R_1—X—, R_2—Y—, R_3, at least one piperidine radical of formula (II) present, effective to increase the light stability of said synthetic polymer.

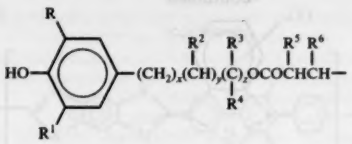
4,108,830

SULFUR-CONTAINING PHENOLIC ANTIOXIDANTS

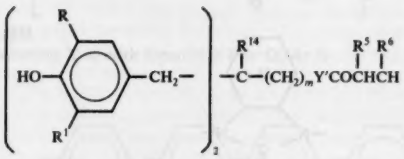
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 597,804, Jul. 21, 1975, abandoned. This application Mar. 31, 1976, Ser. No. 672,105
Int. Cl.[2] C07C *69/34, 69/74, 69/76, 103/19, 103/24;* C08R *5/36*
U.S. Cl. 260—45.85 S **8 Claims**

1. A compound having the following structural formula: AXA wherein A and A^1 are selected from structures I and II as follows:

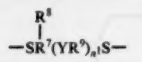


(I)

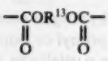


(II)

and X is



wherein Y' is —O— or —NH— and wherein R and R^1 are selected from the group consisting of tertiary alkyl radicals having 4 to 8 carbon atoms and cycloalkyl radicals having 5 to 12 carbon atoms, R^2, R^3, R^4, R^5, R^6 and R^8 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, R^7 is selected from the group consisting of alkylene radicals having 2 to 6 carbon atoms, cycloalkylene radicals having 5 to 12 carbon atoms and alkyl cycloalkylene radicals having the structural formula $—R^{11}—R^{10}—[R^{12}]_{n^2}—$, wherein R^9 is an alkylene radical having 2 to 6 carbon atoms, Y is selected from the group consisting of —O—, —S—, 1,4 phenylene and



and wherein n^1 is 0 or 1, $x+y+z$ is 0 or a whole number from 2 to 12, R^{10} is a cycloalkylene radical having from 5 to 12 carbon atoms, R^{11} and R^{12} are alkylene radicals having from 1 to 6 carbon atoms and n^2 is 0 or 1, and wherein R^{13} is an alkylene radical having from 2 to 6 carbon atoms which can be substituted or unsubstituted with one or two groups of the structure

wherein B conforms to structural formula

and wherein R^{14} is selected from the group consisting of alkyl radicals having 1 to 4 carbon atoms and phenyl and m is 0 or 1 with the proviso that when Y' is —O—, m is 1.

7. A polymer prepared from ethylenically unsaturated monomers having incorporated therein a compound according to claim 1.

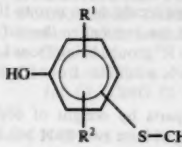
4,108,831

HYDROXYALKYLTHIO PHENOLIC ANTIOXIDANTS

Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

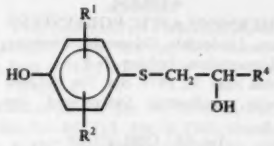
Filed Jun. 2, 1975, Ser. No. 583,064
Int. Cl.² C08K 5/36; C07C 149/36
U.S. Cl. 260—45.95 C **9 Claims**

1. A conjugated diene polymer susceptible to oxidative degradation having incorporated therein a stabilizing amount of a compound having the following structural formula:



wherein R^1 and R^2 are selected from the group consisting of hydrogen and hydrocarbon radicals containing 1 to 12 carbon atoms, R^3 is a monohydroxy or dihydroxy substituted radical containing 1 to 11 carbon atoms, at least one carbon atom of which is a part of a noncyclic aliphatic portion of the radical, the aliphatic portion of R^3 containing the hydroxy substitution, with the proviso that when R^3 contains 2 hydroxy substituents the substituents are located on different carbon atoms, and wherein the thio radical is attached to the phenolic ring in a position ortho or para to the hydroxy group.

7. A compound having the following structural formula



wherein R^1 and R^2 are selected from the group consisting of hydrogen and hydrocarbon radicals containing 1 to 12 carbon atoms and wherein R^4 is selected from the group consisting of hydrogen, methyl and phenyl with the proviso that when R^4 is hydrogen R^1 and R^2 are hydrocarbon radicals containing 1 to 12 carbon atoms.

4,108,832

SILACYCLOPENTYL-BIS-EPSILON-CAPROLACTAM

James R. Hahn, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 644,379, Dec. 29, 1975, Pat. No. 4,012,375.
This application Nov. 22, 1976, Ser. No. 743,820
Int. Cl.² C08G 77/04
U.S. Cl. 528—32 **1 Claim**

1. A method of increasing the molecular weight of an organosiloxane having silicon-bonded hydroxyl radicals comprising mixing silacyclopentenyl-bis-epsilon-caprolactam and the organosiloxane.

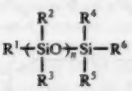
4,108,833

SILICONE RUBBER COMPOSITIONS

Masayuki Hatanaka, Gunma; Makoto Matsumoto, Ashikaga, and Masaharu Yonezawa, Oota, all of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1976, Ser. No. 743,234
Claims priority, application Japan, Dec. 24, 1975, 50-155352
Int. Cl.² C08J 9/02
U.S. Cl. 528—31 **11 Claims**

1. A silicone rubber composition consisting essentially of (A) 100 parts by weight of diorganopolysiloxane having the formula



wherein R^1, R^2, R^3, R^4, R^5 and R^6, which can be the same

or different, are organo groups selected from the group consisting of alkyl, vinyl and phenyl, with the provisos that from 0.01 to 2.0 mole percent thereof are vinyl and there are at least two vinyl groups in the molecule, from zero to 10 mole percent thereof are phenyl, and the remainder thereof are alkyl, the average number of R^1 to R^6 groups being from 1.98 to 2.02, per one silicon atom, and n is a number from 50 to 10000 on the average,

(B) from 0.1 to 10 parts by weight of organohydrogenpolysiloxane having at least two Si-H bonds in the molecule, and the average degree of polymerization is from 6 to 5,000,

(C) from 0.0001 to 0.2 parts by weight of (O) valent platinum-(III) phosphor complex, and

(D) from zero to 200 parts by weight of inorganic filler.

4,108,834

THERMOPLASTIC POLYESTERS

Lothar Buxbaum, Lindenfels, Odenwald, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 31, 1977, Ser. No. 801,940

Claims priority, application Switzerland, Jun. 11, 1976, 7418/76

Int. Cl.[2] C08G *63/68*

U.S. Cl. 528—289 **12 Claims**

1. A linear thermoplastic polyester, having a relative viscosity of 1.1 to 3.5 measured on a solution of 1 gram of polyester in 100 ml of a solvent consisiting of equal parts of phenol and symmetrical tetrachloroethane at 30° C, which comprises the condensation product in about a 1:1 molar ratio of diacids (a) and (a') with diols (b) and (c) so that the composition of the polyester comprises

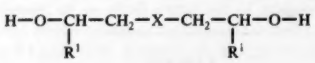
in the diacid component of the polyester

(a) from 35 to 50 mol %, based on the total polyester, of radicals of aromatic dicarboxylic acids; and (a') from 15 to 0 mol %, based on the total polyester, of radicals of aliphatic dicarboxylic acids; and

in the diol component of the polyester

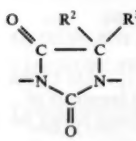
(b) from 25 to 49 mol %, based on the total polyester, of radicals of at least one aromatic diol, and

(c) from 25 to 1 mol %, based on the total polyester, of radicals of at least one diol of the general formula I

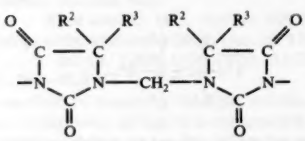


(I)

wherein R^1 represents a hydrogen atom, methyl, ethyl or phenyl, and X represents a radical of the formulae *Ia* to *If*



(Ia),



(Ib),

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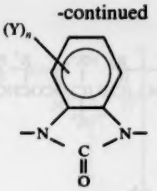
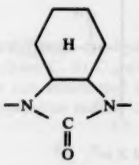
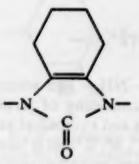


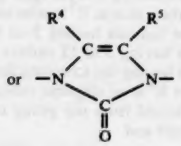
(Ic),



(Id),



(Ie)



(If)

wherein R^2 represents a hydrogen atom, methyl or ethyl, R^3 represents methyl, ethyl, propyl or isopropyl, R^4 and R^5 represent phenyl which can be partially or completely chlorinated or brominated, and Y represents a chlorine or bromine atom, and *n* represents nought or a number from 1 to 4; with the proviso that a portion of up to at most 10 mol % of the diol radicals of the formula I can be replaced by other aliphatic or cycloaliphatic diol radicals; and

wherein the radicals (a) and (a') are attached to radicals (b) and (c) through ester linkages in a random distribution.

4,108,835

PHENYLATED AROMATIC HETEROCYCLIC POLYMERS

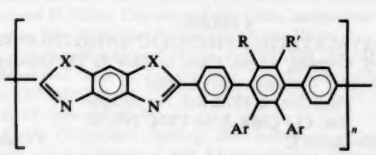
Fred E. Arnold, Centerville, Ohio, and James F. Wolfe, Menlo Park, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1977, Ser. No. 811,345

Int. Cl.[2] C08G *73/22, 75/32*

U.S. Cl. 528—183 **8 Claims**

1. A para-ordered aromatic heterocyclic polymer consisting essentially of repeating units having a structure as represented by one of the following formulas:

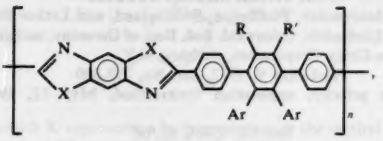


(a)

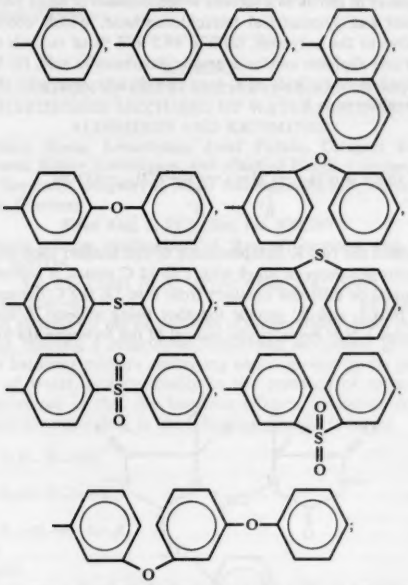
or

-continued

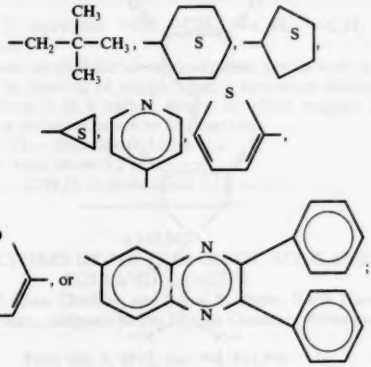
(b)



wherein X in each formula is S or O; Ar is



R and R′ are hydrogen, a monovalent aromatic radical as listed above, $-CH_2-CH_3$, $-CH_2-CH_2-CH_3$, $-CH_2-CH-{}_2-CH_2-CH_3$,



and *n* is an integer equal to the number of repeating units and has a value such that the polymer has an intrinsic viscosity of 2 to 12 dl/g as determined in methanesulfonic acid at 30° C.

4,108,836

PROCESS FOR SYNTHESIZING ACETYLENE-SUBSTITUTED POLYIMIDES AND POLYIMIDES THEREOF

Norman Bilow, Encino, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 3, 1977, Ser. No. 773,887

Int. Cl.[2] C08G *73/12*

U.S. Cl. 528—128 **8 Claims**

1. A method for preparing an acetylene end-capped polyimide oligomer, or a monomer mixture which is a precursor to such an oligomer, that is soluble in low-boiling non-toxic solvents and suitable for forming lacquers with high solids content comprising the steps of preparing an alcohol soluble ester by reacting two moles of a dianhydride with a lower aliphatic alcohol thereby forming an alcohol solution with said ester, adding one mole of a diamine to said solution while agitating said solution to form a solution of monomeric reactants containing some amic esters or amine salts and causing said esters or salts to react with two moles of an aminoarylacetylene whereby an alcohol soluble oligomer is formed.

4,108,837

POLYARYLENE POLYETHERS

Robert N. Johnson, New Market, and Alford G. Farnham, Mendham, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 295,519, Jul. 16, 1963, abandoned, Ser. No. 446,715, Apr. 8, 1965, abandoned, Ser. No. 643,840, Jun. 6, 1967, abandoned, and Ser. No. 688,302, Dec. 6, 1967, abandoned. This application Feb. 28, 1972, Ser. No. 230,091

Int. Cl.[2] C08G *65/40, 75/20*

U.S. Cl. 528—126 **63 Claims**

1. A substantially linear thermoplastic polyarylene polyether composed of recurring units having the general formula:

$$\left(O-E-O-E'\right)$$

where E is the residuum of a dihydric phenol and E′ is the residuum of a benzenoid compound having an inert electron withdrawing group in one or more of the positions ortho and para to the valence bonds having a sigma* value above about +0.7, and where both of said residuum are valently bonded to the ether oxygens through aromatic carbon atoms with the provisos that E and E′ may not both include a divalent sulfone group and may not both include a divalent carbonyl group linking two aromatic nuclei.

4,108,838

PROCESS FOR THE PRODUCTION OF SOLID THERMOPLASTIC TERPOLYMERIZATE OF TRIOXANE

Herbert Amann, and Gerhard Morlock, both of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1976, Ser. No. 655,358

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1975, 2505110

Int. Cl.[2] C08G *2/24, 2/10*

U.S. Cl. 528—249 **11 Claims**

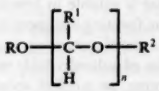
1. Process for the production of a solid thermoplastic terpolymer of trioxane, said process comprising polymerizing trioxane in the presence of a prepolymer having recurring units consisting essentially of about 87 to about 99 weight percent units derived from at least one cyclic formal and about 13 to about 1 weight percent units derived from diglycerin diformal, and in the presence of a cationic catalyst.

4,108,839
PHOTOSENSITIVE POLYALDEHYDES AND USE IN PHOTOIMAGING

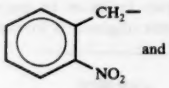
William John Chambers, Wilmington, and Robert Paul Foss, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

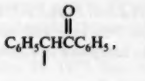
Filed Jan. 21, 1977, Ser. No. 760,935
Int. Cl.[2] C08G *2/28, 2/32, 2/36*
U.S. Cl. 528—270 6 Claims

1. A photosensitive polyaldehyde having the formula:



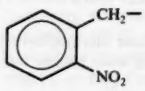
wherein R is a photosensitive end group selected from


(a)


(b)

R^1 is H or n-alkyl of 1–5 carbon atoms,

R^2 is (a) n-alkanoyl of 1–4 carbon atoms or (b) n-alkanoyl of 1–4 carbon atoms or



when R^1 is H, and

n is a positive integer of about 10–4000.

4,108,840
UREA-URETHANE-ACRYLATE RADIATION CURABLE COATING COMPOSITIONS AND METHODS OF MAKING SAME

Charles B. Friedlander, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 15, 1977, Ser. No. 787,820
Int. Cl.[2] C08G *18/67, 18/42, 18/08;* C08L *75/06*
U.S. Cl. 528—46 26 Claims

1. Radiation polymerizable resin comprising the reaction product of:

a. a prepolymer moiety having a plurality of isocyanato groups;

b. water in an amount sufficient to react with only a portion of the isocyanato groups of said prepolymer moiety to form in said reaction product at least one urea group linking two prepolymer moieties; and

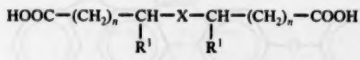
c. a polyfunctional compound containing at least one functional group which is reactive with an isocyanato group of said prepolymer moiety and which polyfunctional compound after reaction with said isocyanato group provides at least one ethylenic functional group in said reaction product.

4,108,841
THERMOPLASTIC POLYESTERS AND PROCESSES FOR THEIR MANUFACTURE

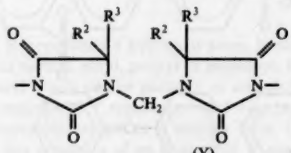
Jürgen Habermeier, Pfeffingen, Switzerland, and Lothar Buxbaum, Lindenfels, Odenwald, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

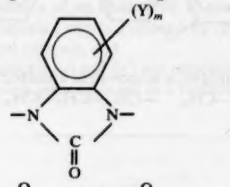
Filed May 9, 1977, Ser. No. 795,350
Claims priority, application Switzerland, May 12, 1976, 5934/76
Int. Cl.[2] C08G *63/68*
U.S. Cl. 528—289 14 Claims

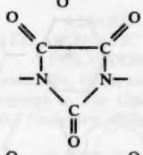
1. A linear thermoplastic polyester, obtained from aromatic and aliphatic dicarboxylic acids and diols, which has a relative viscosity of 1.2 to 3.5, measured at 30° C in a solution of 1 g of polyester in 100 ml of a solvent which consists of equal parts of phenol and symmetrical tetrachloroethane, which contains, relative to the polyester, (a) 0 to 49.5 mol % of radicals of at least one aliphatic and/or aromatic dicarboxylic acid, (b) 50 to 0.5 mol % of radicals of at least one dicarboxylic acid of the general formula I

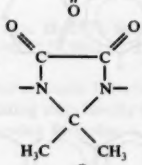

(I)

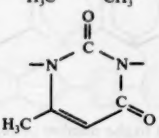
in which the two R^1 independently of one another each denote a hydrogen atom or alkyl with 1 to 12 C atoms, n represents identical or different numbers from 0 to 12, the C content of the $(CH_2)_n$ and R^1 groups together being at least 2, and X denotes a N,N-heterocyclic radical of the formulae IIa to IIf


(IIa),


(IIb),

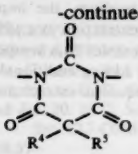

(IIc),


(IId),


(IIe)

or

-continued



(III)

in which R^2 represents a hydrogen atom or the methyl or ethyl group and R^3 represents the methyl, ethyl, propyl or isopropyl group, R^4 and R^5 each denote the methyl, ethyl or phenyl group, Y represents a bromine atom or chlorine atom and m is nought or denotes a number from 1 to 4, and (c) 50 mol % of radicals of at least one aliphatic or cycloaliphatic diol, as co-condensed radicals.

4,108,842

PREPARATION OF POLYURETHANE UREAS USING AS HARDENERS MIXTURES OF WATER, AMINES, ALDIMINES AND KETIMINES

Eberhard Konig, Leverkusen; Josef Pedain, Cologne; Karl-Arnold Weber, Leverkusen, and Manfred Hajek, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 5, 1977, Ser. No. 822,297

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637115

Int. Cl.[2] C08G *18/32, 18/14;* C08K *5/41, 5/07*

U.S. Cl. 528—61 **11 Claims**

1. A process for the preparation of polyurethane ureas comprising reacting a prepolymer containing isocyanate groups and a hardener mixture containing amino groups in the presence of water, and optionally in the presence of solvents, characterized in that the hardener mixture comprises compounds corresponding to the following general formulae

$$H_2N—R—NH_2 \quad (A)$$

$$H_2N—R—N=R_1 \quad (B)$$

$$R_1=N—R—N=R_1 \quad (C)$$

wherein

R represents a divalent aliphatic, cycloaliphatic or araliphatic group having from 2 to 18 carbon atoms which may in addition contain —O— or

(wherein X represents —H, $—CH_3$, $—C_2H_5$, $—C_3H_7$ or $—C_4H_9$); and

R_1 represents an aliphatic or cycloaliphatic group such as is formed by removal of oxygen from a ketone or aldehyde having from 2 to 8 carbon atoms; in which mixture the following molar ratios are to be observed:

(A/B + C) = from about 1:20 to 1:3

(B/C) = from about 1:2 to 2:1 and

A + B + C/H_2O = from about 1:1.4 to 1:20.

4,108,843

COPOLYMERS OF POLYPARABANIC ACIDS AND POLYAMIDE-IMIDES

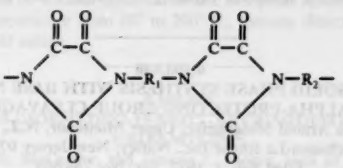
Augustin T. Chen, Cheshire, and Kemal B. Onder, North Haven, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 5, 1977, Ser. No. 812,918

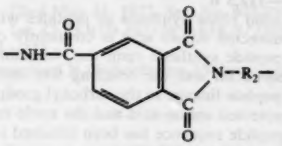
Int. Cl.[2] C08G *18/00*

U.S. Cl. 528—74 **9 Claims**

1. A copolymer characterized by the presence in random arrangement of each of the following recurring units:



and



wherein R_1 represents a member selected from the group consisting of alkylene from 1 to 15 carbon atoms, inclusive, arylene from 6 to 12 carbon atoms, inclusive, and aralkylene from 7 to 25 carbon atoms, inclusive, and R_2 is the residue of an organic diisocyanate $R_2(NCO)_2$ the relative proportions of the numbers of each of the recurring units in the molecule being within the range of 4:1 to 1:4.

4,108,844

PHOTOSENSITIVE POLYESTERS

Wasaburo Kawai, Nishinomiya, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

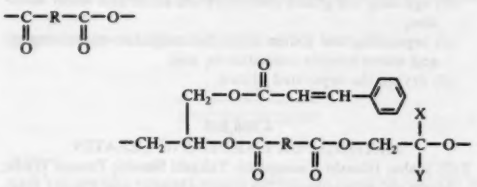
Filed Feb. 22, 1977, Ser. No. 770,847

Claims priority, application Japan, Feb. 25, 1976, 51/20253

Int. Cl.[2] C08G *63/00*

U.S. Cl. 526—217 **4 Claims**

1. A photosensitive polyester composed of at least five repeating units each of the formula:



wherein, X is selected from the group consisting of a hydrogen atom, alkyl groups having one to four carbon atoms, a phenyl group and a cinnamoyl-oxymethyl group, Y is selected from the group consisting of a hydrogen atom and alkyl groups having one to four carbon atoms and R is —CH=CH—.

4,108,845

HIGHLY SHRINKABLE ACRYLIC FIBRES OR FILAMENTS

Ulrich Reinebr; Alfred Nogaj, and Günter Lorenz, all of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 28, 1976, Ser. No. 653,241

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1975, 2504079

Int. Cl.[2] C08F *28/00*

U.S. Cl. 526—240 **3 Claims**

1. A highly shrinkable dry-spun fiber or filaments of an acrylonitrile polymer which contains at least 50% by weight of acrylonitrile and up to 50% by weight of at least one other ethylenically unsaturated monomer being copolymerizable with acrylonitrile which has a tensile strength of at least 2

p/dtex and a shrinkage capacity in boiling water of at least 35%.

4,108,846

SOLID PHASE SYNTHESIS WITH BASE N ALPHA-PROTECTING GROUP CLEAVAGE

Johannes Arnold Meienhofer, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, New Jersey 07110

Filed Feb. 1, 1977, Ser. No. 764,605
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R **6 Claims**

1. In the solid phase synthesis of peptides wherein a first Nα-amino protected amino acid is covalently coupled to a solid phase peptide synthesis resin the Nα-amino protecting group is cleaved off and the resulting free amino group is coupled via peptide linkage to the carboxyl group of a second Nα-amino protected amino acid and the cycle repeated until the desired peptide sequence has been obtained and then said peptide is cleaved from said resin,

the improvement comprising using base labile Nα-amino protecting groups on each of said amino acids and using base to cleave said protecting groups in each cycle.

4,108,847

METHOD FOR PREPARING BLAND PROTEIN ENRICHED PRODUCTS FROM GRAIN GLUTEN

Howard Lee Creinin, Worthington, Ohio, and Michael Shemer, Haifa, Israel, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 9, 1977, Ser. No. 831,777
Int. Cl.[2] A23J *1/12*
U.S. Cl. 260—112 G **5 Claims**

1. A method for preparing a bland, protein enriched product which comprises:

(a) forming an aqueous slurry of a crude grain gluten containing oil and water soluble constituents at a pH between about 6.5 and 10.0 at a temperature at least about 70° C wherein the ratio of water to gluten is at least about 15:1 on a dry weight basis;

(b) agitating the gluten slurry to form an oil and water emulsion;

(c) separating the gluten from the emulsion containing oil and water soluble constituents; and

(d) drying the separated gluten.

4,108,848

METHOD FOR HARDENING GELATIN

Teiji Habu; Hisashi Yamaguchi; Takashi Sasaki; Tsuneo Wada; Masayuki Matsumoto; Takayoshi Omura, and Hiroki Ishii, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1974, Ser. No. 511,917
Claims priority, application Japan, Oct. 8, 1973, 48 112325
Int. Cl.[2] C09H *7/00*
U.S. Cl. 260—117 **7 Claims**

1. A method for hardening gelatin, which comprises treating the gelatin with a combination of a compound having at least two vinylcarbonyl groups in the molecule and a compound having at least two vinylsulfonyl groups in the molecule.

4,108,849

PROCESS FOR EXTRACTING AND PROCESSING GLYCOPROTEINS, MUCOPOLYSACCHARIDES AND ACCOMPANYING SUBSTANCES

André Thomas, 8, rue Pierre et Marie Curie, 75005 Paris, France

Filed Feb. 24, 1975, Ser. No. 552,061
Claims priority, application France, Feb. 25, 1974, 74 06369; Aug. 8, 1974, 74 27513; Feb. 11, 1975, 75 04148
Int. Cl.[2] A23J *1/20*
U.S. Cl. 260—122 **13 Claims**

1. In a process for extracting glycoproteins and mucopolysaccharides from animal or plant matter containing the same by extraction with aqueous medium, the improvement which comprises conducting the extraction at a pH between 7.5 and 9.5, heating said aqueous extract to a temperature of 100° to about 110° C, and without adding additional reagents separating precipitate from the aqueous extract and recovering the aqueous extract.

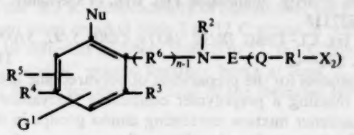
4,108,850

POSITIVE-WORKING IMMOBILE PHOTOGRAPHIC AZO COMPOUNDS

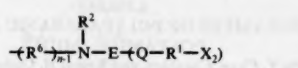
Donald Lee Fields, Rochester; Richard Paul Henzel, Webster; Philip Thiam Shin Lau, and Richard Allan Chasman, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 511,568, Oct. 2, 1974, Pat. No. 3,980,499. This application Apr. 23, 1976, Ser. No. 679,623
Int. Cl.[2] C07C *107/00, 107/04;* C09B *43/12*
U.S. Cl. 260—162 **47 Claims**

1. A compound according to the formula:



wherein Nu is an oxidizable nucleophilic group or a precursor therefor; E is carbonyl or thiocarbonyl; Q is a bivalent group providing a mono atom linkage between E and R^1 and is an amino group providing a mono atom nitrogen linkage, an oxygen atom, a sulfur atom or a selenium atom; G^1 is a substituent as defined for Nu or a dialkylamino group; R^6 is a bivalent alkylene group or a substituted alkylene group containing from 1–3 atoms in the bivalent linkage; *n* is a positive integer of 1 or 2; R^1 is an aromatic group containing from 6–20 carbon atoms or an alkylene group or a substituted alkylene group containing 1–12 carbon atoms; R^2 is an alkyl group, a cycloalkyl group or a substituted alkyl group containing from 1–40 carbon atoms, an aryl group or a substituted aryl group containing from 6–20 carbon atoms, or the substituent X^1; R^3, R^4 and R^5 are each a mono atom group which is a hydrogen atom or a halogen atom, a polyatomic group which is an alkyl group, a cycloalkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, or a sulfamyl group, the substituent X^1 or a 5- to 7-membered cyclic group formed with Nu and R^5 or G^1 and R^4 or R^3, and the substituents for R^3 and R^5 or R^4 and R^5 when on adjacent positions on the ring may be taken together to form a 5- or 6-membered ring with the carbon atoms to which they are attached, with the provision that, when R^1 is an alkylene group or a substituted alkylene group, R^3 and R^4 are polyatomic groups, and when G^1 is a substituent defined for Nu, an adjacent R^3 or R^4 can be the group:



X^1 is provided in at least one of R^2, R^3, R^4 or R^5 and is a ballasting group or an azo dye moiety, provided one of X^1 or $(Q—R^1—X_2)$ is an azo dye moiety, and one of X^1 and $(Q—R^1—X_2)$ is a ballasting group which contains at least 8 carbon atoms and is of a size sufficient to render said compound immobile in an alkali-permeable layer of a photographic element.

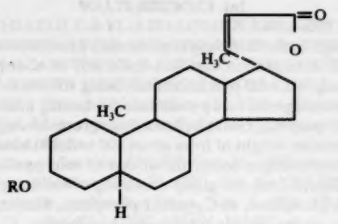
4,108,851

3β,17-DIHYDROXY-5α,17α-PREGN-20-ENE-21-CARBOXYLIC ACID γ-LACTONE AND ESTERS THEREOF

Edward A. Brown, Glenview, and Frank B. Colton, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jul. 20, 1977, Ser. No. 817,318
Int. Cl.[2] C07J *71/00*
U.S. Cl. 260—239.57 3 Claims

1. A compound of the formula



wherein R represents 1-oxoalkyl containing fewer than 9 carbons.

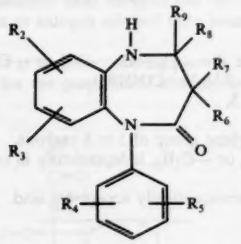
4,108,852

PROCESS FOR PREPARING 1,5-BENZODIAZEPINE-2-ONES

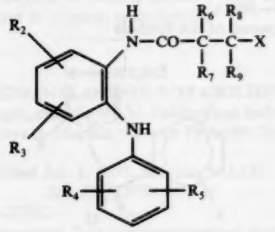
Oskar Bub, Ludwigshafen am Rhein, Fed. Rep. of Germany, assignor to Knoll AG., Ludwigshafen am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 20,413, Mar. 17, 1970, abandoned. This application Feb. 4, 1977, Ser. No. 765,696
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1969, 1913536; Oct. 24, 1969, 1953647
Int. Cl.[2] C07D *243/12*
U.S. Cl. 260—239.3 B 4 Claims

1. The method of making a 1-aryl-2,3,4,5-tetrahydro-1H-1,5-benzodiazepin-2-one of the formula



wherein R_2, R_3, R_4, and R_5 are the same or different and are each hydrogen, lower alkyl, lower alkoxy, or trifluoromethyl; and R_6, R_7, R_8, and R_9 are the same or different and are each hydrogen or lower alkyl, which method comprises reacting a substituted 2-diphenyl amine of the formula



wherein X is halogen, with an alkali metal amide in liquid ammonia or with an alkali carbonate in a polar aprotic solvent at a temperature from 80° to 200° C., thereby directly to cyclize said amine.

4,108,853

N,15-DIDEHYDRO-15-DEOXO-PYRIMIDINO-(4,5-b)RIFAMYCIN S

James R. McCarthy, and Jimmie L. Moore, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 31, 1977, Ser. No. 802,214
Int. Cl.[2] C07D *241/36;* A61K *31/505*
U.S. Cl. 544—245 1 Claim

1. The compound N,15-didehydro-15-deoxo-pyrimidino(4,5-*b*)rifamycin S.

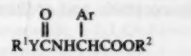
4,108,854

PROCESS FOR PREPARING SUBSTITUTED GLYCINES

John G. Gleason, Cornwall Heights, Pa.; Kenneth G. Holden, Haddonfield, N.J., and Nelson C. F. Yim, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 589,962, Jun. 24, 1975, Pat. No. 3,994,954, which is a division of Ser. No. 447,468, Feb. 28, 1974, Pat. No. 3,920,730. This application Aug. 16, 1976, Ser. No. 714,723
Int. Cl.[2] C07D *473/00*
U.S. Cl. 544—277 5 Claims

1. A process for preparing a compound of the formula:



where:

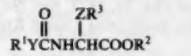
R^1 is lower alkyl of one to four carbon atoms, β,β,β-trichloroethyl, benzyl, p-nitrobenzyl or p-methoxybenzyl;

Y is O or S;

Ar is an aromatic or heteroaromatic group; and

R^2 is hydrogen or an easily-removable carboxyl protective group

comprising reacting a compound of the formula:



where:

R^1, Y and R^2 are unchanged during the reaction and are as defined above except that R^2 cannot be hydrogen when ZR^3 is phenoxy;

Z is O or S; and

R^3 is lower alkyl of one to four carbon atoms, phenyl or benzyl, the phenyl or benzyl group being unsubstituted or substituted with one or two lower alkyl, lower alkoxy, hydroxy, halo, nitro, amino or acetamido groups with a compound having an aromatic or heteroaromatic group capable of replacing said ZR^3 group.

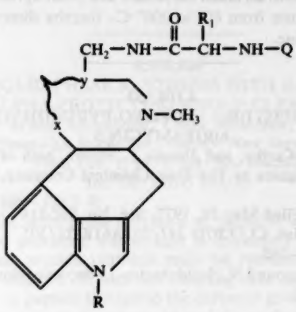
4,108,855

COMPOUNDS OF ERGOLENE AND ERGOLINE STRUCTURE AND METHOD FOR THE PREPARATION THEREOF

Erzsébet Magó nee Karácsony; Sándor Bajusz; József Borsi; Ildikó Király; Endre Csányi, and Istvan Polgári, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

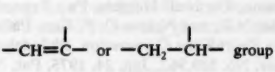
Filed Mar. 2, 1977, Ser. No. 773,792
Claims priority, application Hungary, Mar. 9, 1976, GO 1332
Int. Cl.[2] C07D *457/02*
U.S. Cl. 260—285.5 10 Claims

1. A compound of the formula



(I)

wherein R stands for a hydrogen atom or a methyl group, *x y* stands for a



and Q designates a hydrogen atom or a benzyloxycarbonyl- or N-tert.-butyloxycarbonyl protective group, and R_1 represents the side-chain of a natural α-amino acid selected from the group consisting of Arg—, Tryp—, Phe—, Ser—, Leu—, Val—, Meth—, Tyr—, His— and Prol— side-chain, and the pharmaceutically acceptable acid addition salts thereof.

4,108,856

CHLORINATION PROCESS FOR PRODUCING 2,3,5-TRICHLOROPYRIDINE

Roy Dennis Bowden, and Thomas Seaton, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 25, 1977, Ser. No. 845,389

Claims priority, application United Kingdom, Oct. 26, 1976, 44408/76

Int. Cl.² C07D *213/04*

U.S. Cl. 260—290 HL **6 Claims**

1. A process for the production of 2,3,5-trichloropyridine which comprises interacting 3,5-dichloropyridine with chlorine at a temperature in the range from 300° C to 460° C.

4,108,857

IMIDAZOLYLMETHYL METHANOBENZAZOCINES

Noel F. Albertson, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 605,272, Aug. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 133,400, Apr. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 856,157, Sep. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 642,224, May 29, 1967, abandoned, which is a continuation-in-part of Ser. No. 405,244, Oct. 20, 1964, Pat. No. 3,382,249. This application Feb. 28, 1977, Ser. No. 772,984

Int. Cl.² C07D *221/26*

U.S. Cl. 260—293.54 **4 Claims**

1. 1,2,3,4,5,6-Hexahydro-3-(Y)-6-(R^1)-11-(R^2)-2,6-methano-3-benzazocine wherein Y is (1-lower alkylimidazol-5-yl)methyl, R^1 is lower alkyl and R^2 is hydrogen or lower alkyl.

4,108,858

POLYOLEFIN QUATERNARY PYRIDINIUM SALTS

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 613,369, Sep. 15, 1975, Pat. No. 4,056,531, which is a division of Ser. No. 395,221, Sep. 7, 1973, abandoned, which is a division of Ser. No. 255,223, May 19, 1972, Pat. No. 3,778,371, which is a continuation-in-part of Ser. No. 138,758, Apr. 29, 1971, abandoned. This application Oct. 29, 1976, Ser. No. 736,842

Int. Cl.² C07D *213/04*

U.S. Cl. 260—294.8 E **9 Claims**

1. A high molecular weight quaternary pyridinium salt effective as a detergent in distillate fuels and as a dispersant in lubricating oils, said pyridinium salt being soluble in said fuels and lubricating oils, said pyridinium salt having a substantially saturated poly-C_{2-4} olefin hydrocarbon group having an average molecular weight of from about 800 to 1,400 bonded to the pyridinium nitrogen atom, the anions of said pyridinium salt being selected from the group consisting of halides, phosphate, C_{1-12}alkylphosphate, di-C_{1-12}alkyl phosphate, borate, C_{1-12}alkylborate, nitrite, nitrate, carbonate, bicarbonate, C_{1-12}alkanoate, and di-C_{1-12}alkyl dithiocarbamate, and O,O-di-C_{1-12}alkyl dithiophosphate.

4,108,859

MICROBICIDAL (PYRIDINYLAMINO) ALKYL GUANIDINES

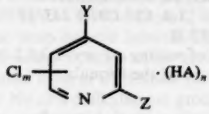
Yulan C. Tong, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1977, Ser. No. 804,038

Int. Cl.² C07D *213/53*

U.S. Cl. 260—296 R **11 Claims**

1. A (pyridinylamino)alkylguanidine of the formula



wherein:

one of Y and Z is —H, —Cl, —CCl_3 or —CN and the other is —NH—R^1—N=C(NHR^2)$_2$,

m is 1, 2 or 3,

n is 1 or 2,

R^1 is an alkylene group of 3 to 8 carbons,

R^2 is —CH_3 or —C_2H_5, independently in each occurrence, and

HA is a pharmaceutically acceptable acid.

4,108,860

TRIAZOLOBENZISOTHIAZOLE-1,1-DIOXIDES

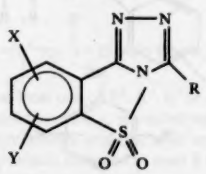
Peter C. Wade, Pennington, N.J.; B. Richard Vogt, Yardley, Pa., and Thomas P. Kissick, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 3, 1978, Ser. No. 875,018

Int. Cl.² C07D *275/04*; A61K *31/425*

U.S. Cl. 260—304 A **7 Claims**

1. A compound of the formula



wherein

R is hydrogen, lower alkyl, phenyl or substituted phenyl wherein the phenyl substituent is halogen, lower alkyl, lower alkoxy or nitro; and

X is hydrogen, halogen, lower alkyl, lower alkoxy or nitro; and

Y is hydrogen, halogen or lower alkoxy, with the proviso that when Y is other than hydrogen, X represents the same substituent as Y.

4,108,861

AZETOTHIAZOLE-5-YL-3-HALOMETHYL-2-BUTENOIC ACID DERIVATIVES AND THE PREPARATION OF 5-THIA-1-AZABICYCLO-[4.2.0]-2-OCTENE-2-CARBOXYLIC ACID DERIVATIVES FROM THEM

Yoshito Kishi; Shinichi Nakatsuka, and Hideo Tanino, all of Cambridge, Mass., assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

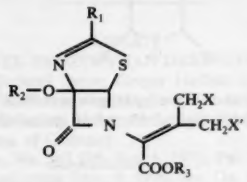
Continuation of Ser. No. 627,577, Oct. 31, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,582

Claims priority, application Japan, Nov. 6, 1974, 49-128477

Int. Cl.[2] C07D *513/04, 501/02*

U.S. Cl. 260—306.7 C **14 Claims**

1. A compound of the formula



wherein

R_1 is lower alkyl, aryloxy(lower)alkyl or ar(lower)alkyl,

R_2 is lower alkyl,

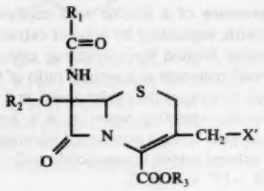
$COOR_3$ is esterified carboxy selected from lower alkoxycarbonyl and ar(lower)alkoxycarbonyl,

X is halogen selected from bromine and chlorine, and

X' is hydrogen or halogen selected from bromine and chlorine,

said aryl and said ar each constituting phenyl, tolyl or xylyl.

8. A process for the preparation of compound of the formula:



comprising dissolving a compound according to claim 1 in a conventional solvent to form a solution, then allowing said solution to stand at ambient temperature.

4,108,862

3-(4-CHROMANYLAMINO)-2-OXAZOLIDINONES

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,124

Int. Cl.[2] C07D *263/26*

U.S. Cl. 260—307 C **2 Claims**

1. The compound 3-(4-chromanylamino)-2-oxazolidinone tetartohydrate.

2. The compound 3-[(6-amino-4-chromanyl)amino]-2-oxazolidinone hydrochloride.

4,108,863

COPPER PHTHALOCYANINE OF NOVEL CRYSTAL FORM

Atsushi Komai, Takatsuki; Naoyuki Shirane, Toyonaka; Yuji Ito, Amagasaki; Sadao Terui, Osaka, and Michikazu Ninomiya, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Dec. 27, 1976, Ser. No. 754,738

Claims priority, application Japan, Jan. 1, 1976, 51-157

Int. Cl.[2] C09B *47/04*

U.S. Cl. 260—314.5 **1 Claim**

1. Copper phthalocyanine of a novel crystal form which by measurement using CuKα radiation of $\lambda = 1.5418$ A.U. shows an X-ray diffraction pattern having peaks at Bragg's angles 2θ equal to about 8.6°, 17.2°, 18.3°, 23.2°, 25.3°, 26.5°, and 28.8°.

4,108,864

TRICYCLOUNDECENE-1,2,3,4,9,9-HEXAHALO-5,6-DIACYL COMPOUNDS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Filed Nov. 23, 1976, Ser. No. 744,335

Int. Cl.[2] C07C *61/12;* **C07D** *209/94, 307/93*

U.S. Cl. 260—326 C **13 Claims**

1. A tricycloundecene-1,2,3,4,9,9-hexahalo-5,6-diacyl compound selected from the group consisting of 1,2,3,4,9,9-hexahalo-1,4,4a,5,6,8a-hexahydro-1,4-methanonaphthalene-5,6,-dicarboxylic acid compounds, 1,2,3,4,9,9-hexahalo-1,4,4a,5,8-,8a-hexahydro-1,4,-methanonaphthalene-5,6-dicarboxylic acid compounds and 1,2,3,4,9,9-hexahalo-1,4,4a,7,8,8a-hexahydro-1,4-methanonaphthalene-5,6-dicarboxylic acid compounds wherein the said acid compounds are selected from the group consisting of free acids and acid salts, esters, acyl halides, amides, imides, and anhydrides thereof.

4,108,865

THIOPHENE COMPOUNDS AND THE PRODUCTION THEREOF

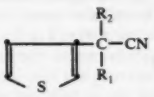
Charles Pigerol, Saint-Ouen; Paul de Cointet de Fillain, Sisteron; Claude Grain, Volonne, and Jacques Le Blay, Luisant, all of France, assignors to Labaz, Paris, France

Continuation of Ser. No. 501,854, Aug. 29, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,927

Int. Cl.[2] C07D *333/00;* **A01N** *9/00*

U.S. Cl. 260—329 R **1 Claim**

1. A novel thiophene derivative corresponding to the general formula:



Ia

wherein R_1 represents a cyclohexyl radical and R_2 represents a hydrogen atom.

4,108,866

SULPHOXIDES

Bernard Tramier, Pau; Raymond Delourme, Billere, and Philippe Fresnel, Castres, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

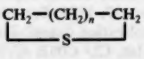
Continuation of Ser. No. 644,718, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 545,487, Jan. 30, 1975, abandoned. This application Jun. 8, 1977, Ser. No. 804,638

Int. Cl.[2] C07D *333/02*

U.S. Cl. 260—329 R **3 Claims**

1. An improvement in the method of producing organic

sulphoxides selected from the group consisting of dialkyl sulphoxides bearing a total of 2 to 36 carbon atoms, their corresponding hydroxy-substituted alkyl sulphoxides and polymethylene sulphoxides having 2 to 6 carbon atoms, by oxidizing a sulfide selected from the group consisting of dialkyl sulfides of formula $R^1—S—R^2$ having a total of 2 to 36 carbon atoms and wherein R^1 and R^2 are chosen from a group consisting of alkyl and hydroxyalkyl groups, and polymethylene sulfides of formula



wherein *n* is an integer of 0 to 4, with hydrogen peroxide in a reaction medium of an aqueous acidic medium and a solvent selected from the group consisting of benzene, toluene, hexane, heptane, dichloroethane, chloroprene, propyl acetate and isobutyl acetate, said solvent forming an azeotropic mixture with between 5 and 20% by weight of water, said solvent having the capacity for dissolving the dialkyl sulfides, while leaving the sulphoxide substantially undissolved at a temperature substantially below the boiling point of said mixture, and

separating the sulphoxide formed from the reaction medium by distilling the azeotropic mixture from the solvent after the oxidation has been effectuated and allowing said medium to cool to the point where a precipitation of sulphoxide is formed.

4,108,867

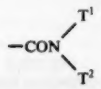
2-AMINOTHIOPHENES

David Boyd Baird; Alan Thomas Costello; Brian Ribbons Fishwick; Robert David McClelland, and Peter Smith, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 324,190, Jan. 16, 1973, abandoned. This application May 1, 1974, Ser. No. 466,059
Claims priority, application United Kingdom, Jan. 28, 1972, 4046/72; Jan. 8, 1973, 965/73
Int. Cl.² C07D *333/24;* A01N *9/00;* C09B *27/00*
U.S. Cl. 260—332.2 C **6 Claims**

1. A compound of the formula:-

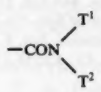
wherein X is selected from the group consisting of lower alkyl sulphonyl, phenylsulphonyl, cyano, carboxylic acid, lower alkoxycarbonyl, lower alkoxy lower alkoxycarbonyl and carbonamido of the formula



wherein T^1 is selected from hydrogen, lower alkyl and phenyl, and T^2 is selected from hydrogen and lower alkyl;

Y is selected from hydrogen, lower alkyl, phenyl and nitrophenyl;

and Z is selected from the group consisting of nitro, cyano and carbonamido of the formula



wherein T^1 is selected from hydrogen, lower alkyl and phenyl, and T^2 from hydrogen and lower alkyl.

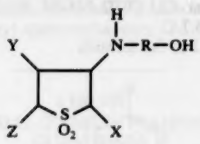
4,108,868

3-(HYDROXYHYDROCARBYLSECONDARYAMINO)-THIOPHENE 1,1-DIOXIDES AND POLYURETHANES CHAIN EXTENDED THEREWITH

Chung-Ling Mao, Sandy Hook, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 434,470, Jan. 18, 1974, Pat. No. 3,887,503. This application Feb. 24, 1975, Ser. No. 552,497
Int. Cl.² C07D *333/48;* C08K *5/05*
U.S. Cl. 260—332.1 **4 Claims**

1. As a new chemical compound, a chain extending agent for a polyurethane which is a long chain polyol-polyisocyanate reaction product, said agent being bifunctional with respect to ability to react with isocyanate and being a 3-hydroxyhydrocarbylsecondaryamino)thiophene 1,1-dioxide having the following structural formula



wherein X, Y and Z are hydrogen and R is an open chain alkylene group having 2 to 10 carbon atoms substituted with a phenyl group.

4,108,869

PREPARATION OF AN ACETAL FROM A DIOL AND ACROLEIN

Harry Bugbird Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 25, 1977, Ser. No. 827,597
Int. Cl.² C07D *319/04*
U.S. Cl. 260—340.7 **20 Claims**

1. In a continuous process for reacting acrolein with a polyol in the presence of an acid catalyst to form a cyclic acetal and water, the improvement comprising reacting an aliphatic 1,3-diol of 3 to 10 carbon atoms at a temperature of from 0° to 100° C with acrolein at a mole ratio of diol:acrolein of from 1.5:1 to 10:1 in the presence of a soluble acid catalyst and simultaneously therewith, separating by solvent extraction the cyclic acetal and water formed by contacting countercurrently a solvent with said reactants at a weight ratio of 0.2:1 to 10:1 of solvent:acrolein to extract the cyclic acetal as it is formed with the solvent while extracting water as it is formed with the 1,3-diol, said solvent being a nonpolar hydrocarbon or chlorohydrocarbon solvent which is immiscible with the 1,3-diol and which boils at −10° to 300° C.

4,108,870

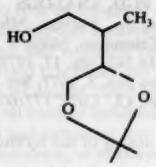
STEREOCONTROLLED SYNTHESIS OF α-MULTISTRIATIN

Josef Fried, and William J. Elliott, both of Chicago, Ill., assignors to University of Chicago, Chicago, Ill.

Filed Jun. 6, 1977, Ser. No. 803,734
Int. Cl.² C07D *317/08*
U.S. Cl. 260—340.9 R **7 Claims**

1. A stereocontrolled synthesis of an isomeric mixture containing a major portion of α-multistriatin and a minor portion of γ-multistriatin comprising the steps of:

(a) forming (2'RS, 4SR')-2'-(2,2-dimethyl-1,3-dioxacyclopent-4-yl)-1'-propyl tosylate by a reaction of the acetonide alcohol having the structure



with tosyl chloride;

(b) forming (2'RS, 4SR)-2'-(2,2-dimethyl-1,3-dioxacyclopent-4-yl)-1'-iodopropane by reaction of the tosylate obtained in step (a) with NaI;

(c) forming (2'RS, 4SR)-2'-(2,2-dimethyl-1,3-dioxacyclopent-4-yl)-4'-ξ-methylhept-5'-one by preparing the enolate of 3-pentanone with lithium diisopropylamide and alkylating the enolate with the iodopropane obtained in step (b); and

(d) forming a mixture comprising a major amount of α-multistriatin and a minor amount of γ-multistriatin by removing the acetonide group and cyclizing the ketone obtained in step (c).

4,108,871

NOVEL BENZOPYRAN DERIVATIVES

Ulrich Eder; Gerhard Sauer; Gregor Haffer; Jurgen Ruppert, and Rudolf Wiechert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

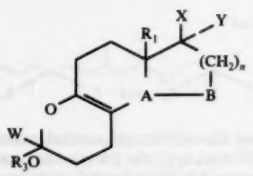
Division of Ser. No. 367,509, Jun. 6, 1973, Pat. No. 3,962,280. This application Mar. 5, 1976, Ser. No. 664,315

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1972, 2228473; Jun. 8, 1972, 2228475

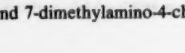
Int. Cl.² C07D *311/04*

U.S. Cl. 260—345.2 **12 Claims**

1. A benzopyran of the formula



wherein —A—B— is >CH—CH_2— or >C=CH—; *n* is the integer 1 or 2; R_1 and R_3 each are lower alkyl; X is hydroxy, acyloxy wherein acyl is the acyl radical of an unsubstituted or phenyl substituted alkanoic acid of 1–10 carbon atoms, unsubstituted or phenyl substituted alkoxy of 1–10 carbon atoms; Y is hydrogen or together with X represents =O; and W is



wherein V is halogen; R_5 is lower alkyl.

4,108,872

7-DIMETHYLAMINO-4-CHROMANONE

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,125

Int. Cl.² C07D *311/22*

U.S. Cl. 260—345.2 **1 Claim**

1. The compound 7-dimethylamino-4-chromanone.

4,108,873

O-(CARBOXYMETHYL)-4-CHROMANONE OXIME

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,103

Int. Cl.² C07D *311/04*

U.S. Cl. 260—345.2 **1 Claim**

1. The compound O-(carboxymethyl)-4-chromanone oxime.

4,108,874

PRODUCTION OF MALEIC ANHYDRIDE

Koji Moriya, and Itsuo Furuoya, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 21, 1975, Ser. No. 560,802

Claims priority, application Japan, Apr. 9, 1974, 49-40566; May 22, 1974, 49-58117

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **2 Claims**

1. In a method for producing maleic anhydride by oxidation of a hydrocarbon having not less than four carbon atoms in gaseous phase in the presence of a catalyst, the improvement wherein the catalyst comprises (a) vanadium oxide, (b) phosphorus oxide and (c), thallium oxide the amount of vanadium oxide relative to phosphorus oxide being from about 1:1 to about 1:5 based on the atomic ratio of vanadium to phosphorus, the amount of vanadium oxide relative to thallium oxide, being from about 1:2 to about 20:1 based on the atomic ratio of vanadium to thallium.

4,108,875

PROCESS FOR THE PRODUCTION OF ACYL CYANIDES (B)

Herbert Klenk; Heribert Offermanns, both of Hanau, and Werner Schwarze, Frankfurt, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 802,942

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708182

Int. Cl.² C07D *307/36*; C07C *57/00, 63/06*

U.S. Cl. 260—347.8 **30 Claims**

1. In a process for the production of on acyl cyanide of the formula

(I)

where R is alkyl having 2 to 18 carbon atoms, alkyl of 1 to 18 carbon atoms substituted by phenyl or halogen, cycloalkyl having 3 to 8 carbon atoms in alkyl group, cycloalkyl having 3 to 8 carbon atoms substituted by 1 to 3 carbon atom alkyl or halogen with the proviso that any phenyl or halogen substituent on the alkyl or any halogen substitutent on the cycloalkyl is not on the carbon atom adjacent to the carbonyl group or R is naphthyl, five membered heterocyclic group, substituted naphthyl of substituted phenyl wherein the substituent on the naphthyl or phenyl is halogen, nitro, alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms by reacting an acyl halide of the formula.

R — CO — Hal

(II)

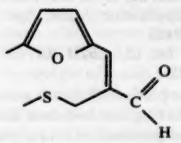
where Hal is chlorine or bromine with a mixture consisting of 0.1 to 5 equivalent of an alkali metal cyanide and 0.05 to 2 equivalents of a copper (I) salt the improvement comprising carrying out the reaction at a temperature of about 50° to 180° C in the presence of a carbocylic acid nitrile which is inert under the reaction conditions.

4,108,876
5-METHYL-ALPHA[(METHYLTHIO)METHYL]-2-FURAN ACROLEIN

Donald Arthur Withycombe, Lincroft; Anne Hruza, Bricktown; Manfred Hugo Vock, Locust; Christopher Giacino, Califon; Braja Dulal Mookherjee, Holmdel; Alan Owen Pittet, Atlantic Highlands, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 753,462, Dec. 22, 1976, Pat. No. 4,064,279.
This application Aug. 24, 1977, Ser. No. 827,211
Int. Cl.[2] C07D *307/46*
U.S. Cl. 260—347.2 1 Claim

1. 5-Methyl-alpha[(methylthio)methyl]-2-furan acrolein having the structure:



4,108,877
PROCESS FOR THE PRODUCTION OF ACYL CYANIDES (A)

Herbert Klenk; Heribert Offermanns, both of Hanau, and Werner Schwarze, Frankfurt, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Jun. 2, 1977, Ser. No. 802,944
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708183
Int. Cl.[2] C07D *307/36;* C07C *57/00, 63/06*
U.S. Cl. 260—347.8 22 Claims

1. A process for the production of an acyl cyanide of the formula

(I)

where R is alkyl having 1 to 18 carbon atoms, alkyl of 1 to 18 carbon atoms substituted by phenyl or halogen, cycloalkyl having 3 to 8 carbon atoms in alkyl group, cycloalkyl having 3 to 8 carbon atoms substituted by 1 to 3 carbon atoms alkyl or halogen with the proviso that any phenyl or halogen substituent on the alkyl or any halogen substituent on the cycloalkyl is not on the carbon atom adjacent to the carbonyl group or R is naphthyl, five membered heterocyclic group, substituted naphthyl or substituted phenyl wherein the substituent on the naphthyl or phenyl is halogen, nitro, alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms comprising reacting at a temperature of about 50° to 180° C an acyl halide on the formula

(II)

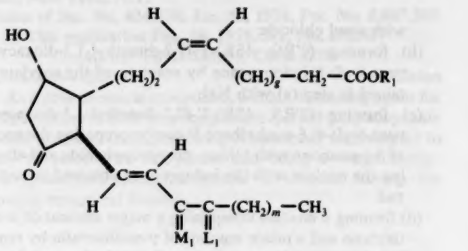
where Hal is chlorine or bromine with CuCN in the presence of a mixture consisting of 1 to 10 equivalents of a carboxylic acid nitrile which is inert under the reaction conditions and about 0.5 to 20 parts by weight of an organic solvent which is inert under the reaction conditions, said solvent being a hydrocarbon, halohydrocarbon, ether or ester.

4,108,878
PGD_2 ANALOGS

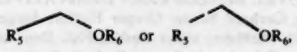
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184.
This application Jan. 3, 1977, Ser. No. 756,096
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—408 16 Claims

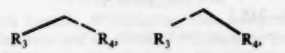
1. A prostaglandin analog of the formula



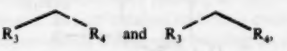
wherein *g* is one, 2, or 3;
wherein *m* is one to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,108,879
HARD BUTTER

Seigi Minowa; Yasuo Toyoshima; Nozomi Yasuda, and Toshiro Tanaka, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Apr. 22, 1977, Ser. No. 789,770
Claims priority, application United Kingdom, Jan. 20, 1977, 2225/77
Int. Cl.[2] C09F *7/08;* C11C *3/14*
U.S. Cl. 260—405.6 9 Claims

1. A hard butter consisting essentially of (a) 10 to 90% by weight of a first hardened oil obtained by hydrogenating and isomerizing palm olein which has an iodine value of at least 55 and is substantially free of tri-saturated glycerides, a first oil fraction obtained by fractionating said first hardened oil and removing low melting and/or high melting substances there-

from, or mixtures of said first hardened oil and said first oil fraction, and (b) 90 to 10% by weight of a second hardened oil obtained by hydrogenating and isomerizing a vegetable oil or fat other than palm oil, said vegetable oil or fat being substantially free of tri-saturated glycerides and having a linoleic acid content of 30 to 55% by weight, based on the total constituent fatty acids, a second oil fraction obtained by fractionating said second hardened oil and removing low melting and/or high melting substances therefrom, or mixtures of said second hardened oil and said second oil fraction, wherein the iodine value of said hard butter is 50 to 75, the trans-isomer content of said hard butter is at least 25% by weight, the palmitic acid content of said hard butter is 15 to 40% by weight based on the total consitutent fatty acids, the stearic acid content of said hard butter is 2 to 10% by weight based on the total constituent fatty acids and the oleic acid content of said hard butter is 55 to 75% by weight based on the total constituent fatty acids.

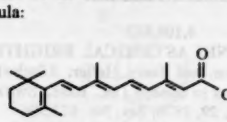
4,108,880
ESTERS OF RETINOIC ACID

Robert J. Gander, Whitehouse, and John A. Gurney, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 3, 1975, Ser. No. 628,177
Int. Cl.[2] C09F 5/08; C11C 3/00
U.S. Cl. 260—410.5 **7 Claims**

1. An ester of all-trans-retinoic acid selected from the group consisting of:

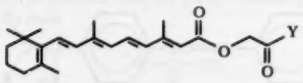
(A) esters of all-trans-retinoic acid having the following formula:



(I)

wherein X is mixed m and p-vinylbenzyl; and

(B) esters of all-trans-retinoic acid having the following formula:



(II)

wherein Y is a member selected from the group consisting of: 4-methoxyphenyl; 4-hydroxyphenyl; 4-methylphenyl; 4-ethoxyphenyl; 4-acetoxyphenyl; 2-naphthyl; 4-biphenyl; 2,5-dimethoxyphenyl; 2,4-dimethylphenyl; 3,4-diacetoxyphenyl; 3,4,5-trimethoxyphenyl; and 2,4,6-trimethylphenyl.

3. 4-(all-trans-retinoyloxyacetyl)-methoxybenzene according to claim 1.

4,108,881
SYNTHESIS OF ZEOLITE ZSM-11

Louis Deane Rollmann, Princeton, N.J., and Ernest William Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 1, 1977, Ser. No. 820,992
Int. Cl.[2] C07F 5/06; C01B 33/28
U.S. Cl. 260—448 C **17 Claims**

1. A synthetic crystalline aluminosilicate zeolite having a formula in terms of mole ratios of oxides in the anhydrous state as follows:

$$(0.5\text{–}10.0)R : (0\text{–}0.5)M_2O : Al_2O_3 : xSiO_2$$

wherein M is an alkali metal ion, R is an alkylenediamine having from 7 to 12 carbon atoms or an organic cation derived therefrom, and x is from 10 to 1000, and having the X-ray powder diffraction pattern substantially as set forth in Table I of the specification.

16. The method for preparing the crystalline aluminosilicate zeolite defined in claim 1 which comprises preparing a mixture containing sources of an alkali metal, an oxide of aluminum, an oxide of silicon, water and an alkylenediamine having from 7 to 12 carbon atoms and having a composition, in terms of mole ratios of oxides, within the following ranges:

$SiO_2/Al_2O_3 = 10\text{–}1000$
$H_2O/SiO_2 = 5 \propto 200$
$OH^-/SiO_2 = 10^{-10}\text{–}1.0$
$M/SiO_2 = 0.1\text{–}2.0$
$R/SiO_2 = 0.01\text{–}2.0$

wherein R is an alkylenediamine having 7 to 12 carbon atoms, and M is an alkali metal ion, and maintaining the mixture at a temperature of at least 50° C until the crystals of said zeolite are formed.

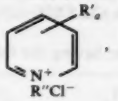
4,108,882
METHOD OF PREPARING METHYLSILOXANES AND METHYLCHLORIDE

Louis G. Mahone, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 27, 1977, Ser. No. 846,066
Int. Cl.[2] C07F 7/08
U.S. Cl. 260—448.2 E **22 Claims**

1. In a method for reacting a silane of the formula (1) R_nSiCl_{4-n} with (2) MeOH to produce siloxanes of the formula $R_nSiO_{4-n/2}$ and MeCl in which R is an alkyl radical of 1–4 carbon atoms and n is 2 or 3, the improvement comprising heating a mixture of (1) and (2) in amounts of not more than a 30% mole excess of either reactant in contact with a quaternary ammonium halide salt catalyst selected from the group consisting of

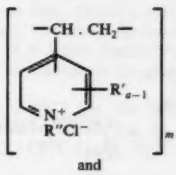
(1) pyridinium chlorides of the formula



,

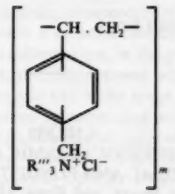
(2) compounds of the formula $R'''_4N^+Cl^-$,

(3)



and

(4)



where R′ is any hydrocarbon radical having 18 or less carbon atoms; a is an integer from 0–5; m is an integer greater than 1; R″ is a lower alkyl radical; and R‴ is selected from the group consisting of methyl, hydroxyalkyl radicals of 2–4 inclusive carbon atoms, aromatic hydrocarbon radicals, and $ArCH_2$— radicals in which Ar is an aromatic hydrocarbon radical, there being no more than 18 carbon atoms total in the R‴ groups.

4,108,883

PROPIONIMIDATE HYDROHALIDES

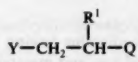
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 706,086, Jul. 16, 1976, Pat. No. 4,044,009, which is a division of Ser. No. 467,332, May 6, 1974, Pat. No. 4,007,200. This application Dec. 20, 1976, Ser. No. 752,497

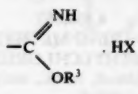
Int. Cl.[2] C07C *119/18*

U.S. Cl. 260—453 RW **6 Claims**

1. A compound having the formula



wherein Y is R^2O, R^2 being alkyl (C_1–C_{10}), aryl (C_6–C_{10}) or aralkyl (C_7–C_{11}), R^1 is hydrogen, methyl or phenyl and Q is



wherein R^3 is alkyl (C_1–C_4), hydroxyalkyl (C_2–C_4) or alkoxyalkyl (C_2–C_4) and X is a halogen.

4,108,884

HYBRID PERFLUOROALKYLENE ETHER THIOIMIDATE ESTER MONOMERS

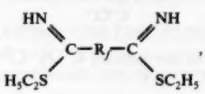
Robert C. Evers, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 21, 1977, Ser. No. 817,657

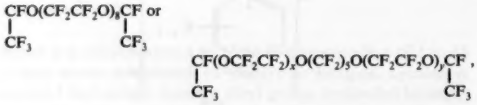
Int. Cl.[2] C07C *119/18*

U.S. Cl. 260—453 RW **5 Claims**

1. A thioimidate ester having the following formula:



wherein R_f is



where $(x+y)$ equals 5 or 6.

4,108,885

SALTS OF THIOCARBAMIC ESTERS WITH FUNGICIDAL AND FUNGISTATIC ACTION

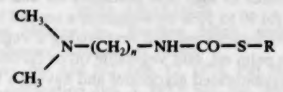
Georg-Alexander Hoyer, and Ernst Albrecht Pieroh, both of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 109,073, Nov. 10, 1970, abandoned, which is a division of Ser. No. 746,711, Jul. 18, 1968, Pat. No. 3,649,674. This application Sep. 20, 1976, Ser. No. 724,820

Int. Cl.[2] C07C *153/09*; A01N *9/12*

U.S. Cl. 260—455 A **3 Claims**

1. A salt of the compound having the general formula



wherein n is an integer from 2 to 4 and R is an alkyl radical having from 2 to 4 carbon atoms, with an organic or inorganic acid.

4,108,886

THIOPROPANOYLAMINO ACID DERIVATIVES

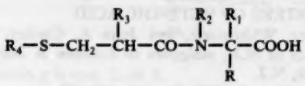
Miguel Angel Ondetti, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 11, 1977, Ser. No. 776,792

Int. Cl.[2] C07C *153/09*; C07D *207/04*; C07C *61/06, 101/04*

U.S. Cl. 260—455 R **7 Claims**

1. A compound of the formula



wherein R and R_1 each is lower alkyl,

R_2 and R_3 each is hydrogen or lower alkyl;

or R_1 joins with R to complete a cyclopentane ring; and

R_4 is hydrogen, lower alkanoyl or benzoyl.

4,108,887

DIVINYL STILBENES AS OPTICAL BRIGHTENERS

Fritz Fleck, Bottmingen, and Juerg Heller, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

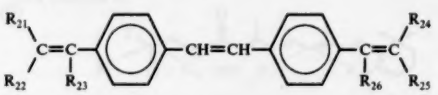
Filed Jan. 29, 1976, Ser. No. 653,506

Claims priority, application Sweden, Feb. 5, 1975, 1474/75

Int. Cl.[2] C07C *63/60, 69/76, 121/70, 147/06*

U.S. Cl. 260—465 H **23 Claims**

1. A compound of formula I″

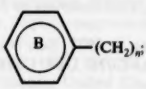


in which

R_{21} and R_{24}, independently, are —CN, —COOR‴ or Rx—SO_2—,

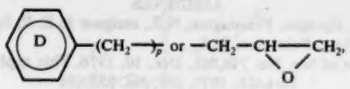
R_{22}, R_{23}, R_{25} and R_{26}, independently, are hydrogen or unsubstituted C_{1-4}alkyl,

Rx is methyl; C_{2-6}alkyl, unsubstituted or mono-substituted by C_{1-4}alkoxy or C_{1-4}-alkoxy-C_{2-6}alkoxy; phenyl, unsubstituted or substituted by up to three substituents selected from up to three selected from C_{1-3}alkyl and halogen, up to two from C_{1-3}alkoxy and up to one —SO_3M group; a radical



naphthyl or mono-sulphonaphthyl,

R‴ is M; methyl; C_{2-6}alkyl, unsubstituted or mono-substituted by hydroxy, C_{1-4}-alkoxy-C_{1-4}alkoxy-C_{2-6}-alkoxy, C_{2-6}-hydroxyalkoxy; cyclohexyl, unsubstituted or substituted by up to 3 C_{1-2}alkyls; phenyl, unsubstituted or substituted by up to three substituents selected from up to three selected from C_{1-3}alkyl and halogen, up to two from C_{1-3}alkoxy and up to one —SO_3M group; a radical



n and *p*, independently, are 1 or 2,
M is hydrogen or a non-chromophoric cation, and
rings B and D, independently, are unsubstituted or substituted by up to three substituents selected from up to two from C_{1-3}alkyl and up to two from halogen.

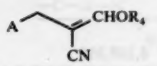
4,108,888

PROCESS FOR PREPARING CYANO-ENOL ETHERS

Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

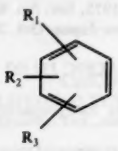
Division of Ser. No. 590,755, Jun. 26, 1975, Pat. No. 4,033,962.
This application Feb. 18, 1977, Ser. No. 770,321
Int. Cl.[2] C07C *121/75*
U.S. Cl. 260—465 F **1 Claim**

1. A process for preparing an enol ether of the formula



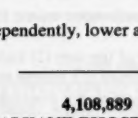
VIIb

wherein A is aryl which comprises reacting an aromatic benzene derivative of the formula



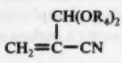
IV

wherein R_1, R_2 and R_3, independently, are hydrogen, lower alkyl, lower alkoxy or non-conjugated lower alkenyl, with an acrylonitrile selected from the group consisting of a compound of the formula



V

and a compound of the formula



VI

wherein R_4 is, independently, lower alkyl, in the presence of an acid catalyst.

4,108,889

PREPARING ALKANE PHOSPHONIC ACIDS AND INTERMEDIATES

Daniel Stedman Connor, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 19, 1976, Ser. No. 743,186
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.4 R **7 Claims**

1. Process for preparing long chain alkane phosphonic acids, said process comprising the steps of

(a) reacting alpha olefin with cation exchange resin to convert at least about 98% of the alpha olefin to obtain high yields of internally unsaturated olefin while minimizing dimer formation, said alpha olefin being a straight chain or branched aliphatic olefin containing from 12 to 22 carbon atoms, said cation exchange resin being a macroreticular resin of the strong acid type in the hydrogen form and having a moisture content ranging by weight from about 3% to about 15%, said reaction being carried out at a temperature ranging from about 80° to about 130° C;

(b) reacting resulting internally unsaturated olefin with dimethyl phosphite to produce non-terminally substituted alkanephosphonic acid dimethyl ester; and

(c) reacting said dimethyl ester with anhydrous hydrogen chloride or anhydrous hydrogen bromide to displace the methyl groups as methyl halides.

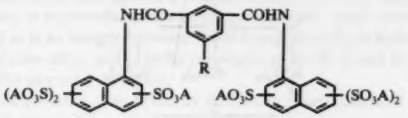
4,108,890

NITRO OR AMINO PHENYLENEBIS(CARBONYLIMINO)DINAPHTHALENETRISULFONIC COMPOUNDS AS COMPLEMENT INHIBITORS

Seymour Bernstein, New City, N.Y.; Robert Herman Lenhard, Paramus, N.J., and Ransom Brown Conrow, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 684,690, May 10, 1976, Pat. No. 4,051,176.
This application Jul. 5, 1977, Ser. No. 813,131
Int. Cl.[2] C07C *143/52*
U.S. Cl. 260—507 R **7 Claims**

1. A compound selected from those of the formula:



wherein R is NO_2 or NH_2; and A is hydrogen, alkali metal or alkaline earth, with the proviso that each A is identical in the same compound.

4,108,891

PROCESS FOR OXIDATION OF MONOSACCHARIDES

Kenichi Hattori, Musashino; Bunji Miya; Morio Matsuda, both of Wakayama; Mutsuo Ishii, Oomiya; Hisashi Saito, Higashimurayama; Hiroshi Watanabe, Kawagoe, and Hidemitu Takizawa, Saitama, all of Japan, assignors to Kao Soap Co., Ltd. and Kawaken Fine Chemicals Co., Ltd., both of Tokyo, Japan

Filed Feb. 3, 1977, Ser. No. 765,203
Claims priority, application Japan, Sep. 21, 1976, 51-113376
Int. Cl.[2] C07C *51/26, 59/17*
U.S. Cl. 260—528 **11 Claims**

1. In a process for oxidizing monosaccharides to carboxylic acid derivatives in which a monosaccharide is reacted with oxygen or an oxygen-containing gas, in the presence of a palladium-carbon catalyst, the improvement wherein: said catalyst has a palladium particle size in the range of from 40 to 70 Angstroms and is prepared by suspending activated carbon in an aqueous solution of an alkali metal hydroxide or carbonate, then adding an aqueous solution of a palladium salt to said suspension at a temperature of from 30° C to lower than 60° C to adsorb said palladium salt on said activated carbon, then adding an aqueous solution of formaldehyde to said suspension to reduce said palladium salt to palladium metal and then recovering the palladium-carbon catalyst from the suspension, the amount of said alkali metal hydroxide or carbonate in said suspension being sufficient to maintain the pH of said suspension at a value of at least 9 after adsorption of the palladium salt on the activated carbon has been completed.

4,108,892

BICYCLOALKYL DERIVATIVES OF PROSTAGLANDINS: 11-DEOXY-PGE$_1$ ACIDS AND ESTERS

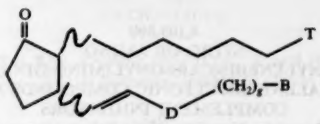
Warren Dexter Woessner; Charles John Sih; Harold Clinton Kluender; Henry Clifford Arndt, and William Gerard Biddlecom, all of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 657,221, Feb. 11, 1976, Pat. No. 4,074,063. This application Jul. 22, 1977, Ser. No. 818,056

Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—514 D 7 Claims

1. A compound having the formula



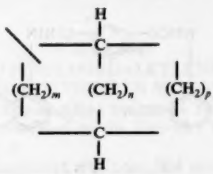
wherein

g is an integer having a value of from 0 to 10;

D is a R-hydroxymethylene or S-hydroxymethylene radical;

T is an alkoxycarbonyl having from 1 to 3 carbon atoms inclusive in the alkyl chain, carboxyl or pharmacologically acceptable nontoxic carboxy salts; and

B is a bicycloalkyl radical of the formula



where *m* and *p* are integers having a value of from 1 to 4; *n* is an integer having a value of from 0 to 4 such that *n* is not 1 when *m* and *p* are both 2; and the sum of *m*, *n* and *p* is greater than or equal to 3 and where the point of attachment of the alkyl chain $(CH_2)_g$ to the bicycloalkyl radical is in the $(CH_2)_m$ bridge or bridgehead position.

4,108,893

PURIFICATION OF AN AQUEOUS SOLUTION OF ACRYLAMIDE

Shiro Asano; Kohei Shizuka, both of Mobara; Junji Mikami, Takaishi; Kenichi Hirakawa, Takaishi, and Mutsuo Matsumura, Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated

Filed Jan. 27, 1977, Ser. No. 762,842

Claims priority, application Japan, Feb. 17, 1976, 51-15480

Int. Cl.^{2} B01D *15/04*

U.S. Cl. 260—561 N 5 Claims

1. In the purification of acrylamide aqueous solutions obtained in a process which comprises reacting in the liquid phase acrylonitrile with water in the presence of a copper-containing catalyst which contains 1–1000ppm of metallic copper, distilling off from the thus obtained crude solution unreacted acrylonitrile and a part of the water substantially in the absence of oxygen, and thereafter purifying the resultant aqueous solution by means of ion exchange resin treatment, the improvement which comprises contacting said crude aqueous solution of acrylamide with a gas selected from the group consisting of oxygen and oxygen-containing gases, the amount of the oxygen dissolved in the solution being at least 4ppm, and thereafter subjecting the aqueous solution to a dual treatment first with a strongly acidic cation exchange resin and then with a weakly basic anion exchange resin.

4,108,894

AMIDINES

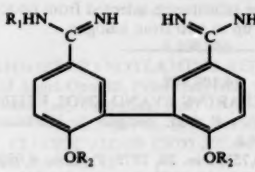
Peter W. Sprague, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 748,861, Dec. 10, 1976. This application Nov. 21, 1977, Ser. No. 853,691

Int. Cl.^{2} C07C *123/00*

U.S. Cl. 260—564 R 10 Claims

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is phenyl or phenyl substituted with one or two methoxy, halogen or trifluoromethyl groups; and R_2 is hydrogen or alkyl of 1 to 12 carbon atoms.

4,108,895

PROCESS FOR PREPARING CYCLOALKANONE OXIMES

Tsuneyuki Kondo, Iwakura, and Akio Kuroda, Nagoya, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 23, 1975, Ser. No. 625,056

Claims priority, application Japan, Oct. 26, 1974, 49-123526; Oct. 26, 1974, 49-123530

Int. Cl.^{2} C07C *131/02*

U.S. Cl. 260—566 A 18 Claims

1. A continuous process for preparing a cycloalkanone oxime which comprises:

(1) contacting a nitrogen compound selected from the group consisting of nitrogen oxides and nitrosyl compounds with an aqueous or an alcoholic solution containing stannous ion, copper ion and chlorine ion wherein the amount of copper is more than 0.01 mole % on the basis of stannous ion, at a temperature of 0 to 100° C under atmospheric or superatmospheric pressure to prepare hydroxylamine,

(2) causing the hydroxylamine to react with an excess amount of a cycloalkanone having 5 to 12 carbon atoms at a temperature of 0 to 50° C to form a cycloalkanone oxime,

(3) separating the cycloalkanone oxime from the reaction mixture by extraction with an organic solvent selected from the group consisting of aliphatic or alicyclic ethers and carboxylic esters having a carbon number of 4 to 12 at a pH of less than 4.5,

(4) recovering the cycloalkanone oxime from the extract of the step (3),

(5) treating the raffinate of the step (3) under atmospheric or superatmospheric pressure at a temperature of 0° to 100° C under a reducing condition for conversion of stannic ion formed in the step (1) to stannous ion, and

(6) recycling the stannous ion to the step (1).

4,108,896

ANTHRACENE DERIVATIVES

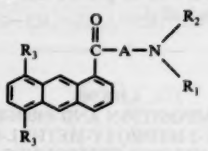
Laird F. Miller, Loveland, Ohio, and Robert W. Fleming, Ann Arbor, Mich., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Dec. 21, 1972, Ser. No. 317,247

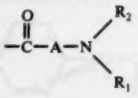
Int. Cl.^{2} C07C *97/10*

U.S. Cl. 260—570.5 C 5 Claims

1. A bis-basic ketone of anthracene having the general formula:



wherein A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; R_1 and R_2 are each selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than the 1-position of the alkenyl group, and when R_1 and R_2 are taken together with the nitrogen atom to which they are attached, represent the pyrrolidinyl, piperidino or morpholino radical; R_3 is selected from the group consisting of hydrogen and the radical



with the proviso that one and only one such R_3 group is hydrogen; and the pharmaceutically acceptable acid addition salts thereof.

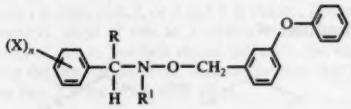
4,108,897

BENZYLHYDROXYLAMINE ETHERS

Arthur C. Henry, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 14, 1977, Ser. No. 777,245
Int. Cl.[2] C07C *87/28*
U.S. Cl. 260—570.8 R **1 Claim**

1. A compound of the formula:



wherein n is 0 or 1, X is lower halogen, R is hydrogen or alkyl of from 1 to 6 carbon atoms, and R^1 is hydrogen or alkyl of from 1 to 6 carbon atoms.

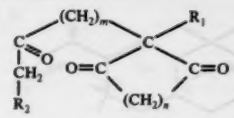
4,108,898

ASYMMETRIC SYNTHESIS OF ORGANIC COMPOUNDS

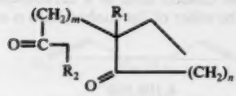
Zoltan George Hajos, Upper Montclair, and David Richard Parrish, Glen Ridge, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 467,356, May 6, 1974, abandoned, which is a division of Ser. No. 96,597, Dec. 9, 1970, Pat. No. 3,975,440, which is a continuation-in-part of Ser. No. 4,762, Jan. 21, 1970, abandoned. This application Sep. 14, 1976, Ser. No. 723,127
The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—586 C **2 Claims**

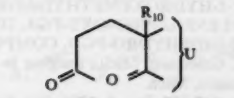
1. A process for the preparation of optically active compounds by means of a stereoselective ring closure which process comprises cyclizing a member of the group consisting of compounds of the formulae



I



IX



XI

where R_1 is lower alkyl, aryl, aralkyl, lower alkenyl or lower alkynyl; R_2 is hydrogen, lower alkyl, aryl, aralkyl and $-(CH_2)_pR_3$ where p is an integer between 0 and 2 inclusive and R_3 is

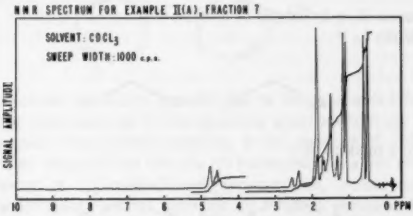
where R_4 is hydrogen or lower alkyl and R_5 is lower alkylenedioxy or arylenedioxy; n is an integer between 1 and 5 inclusive and m is an integer between 1 and 4 inclusive; R_{10} is hydrogen or lower alkyl; and U is the remainder of the B, C and D rings of the steroidal molecule,
in the presence of an optically active α or β-aminoalcohol or α- or β-aminoacid.

4,108,899

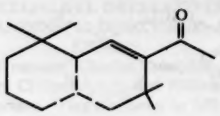
PROCESS FOR PREPARING MIXTURES OF SUBSTITUTED-HEXAHYDRO-ACETONAPHTHONES

William L. Schreiber, Jackson; James N. Siano, Keyport, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 740,890, Nov. 11, 1976. This application Jul. 28, 1977, Ser. No. 819,956
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—586 C **1 Claim**



1. A process comprising the steps of reacting 3-chloromesityl oxide with myrcene thereby forming a chlorine containing Diels-Alder adduct and then dehydrochlorinating the said Diels-Alder adduct to form an acetyl conjugated cyclohexadiene and cyclizing said acetyl conjugated cyclohexadiene to form a mixture of compounds defined by the structure:



wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond.

4,108,900

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-ω-PHENOXY-PGA$_1$ OR 9-DEOXY-9,10-DIDEHYDRO-PGD$_1$ COMPOUNDS

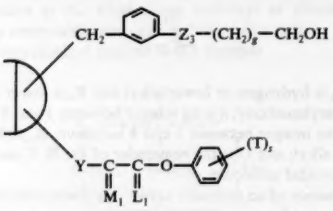
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,020

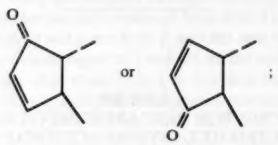
Int. Cl.^{2} C07C *49/82, 49/84*

U.S. Cl. 260—590 C **29 Claims**

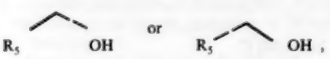
1. A prostaglandin analog of the formula



wherein Z_3 is oxa or methylene;
wherein D is

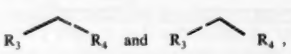


wherein Y is trans-CH=CH-;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is

or a mixture of



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein *g* is 1, 2, or 3; and
wherein *s* is 0, 1, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,108,901

COMPOSITION AND PROCESS 2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-ω-PHENYL-PGE$_1$COMPOUNDS

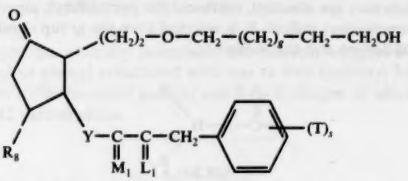
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,023

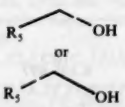
Int. Cl.^{2} C07C *49/84*

U.S. Cl. 260—590 C **39 Claims**

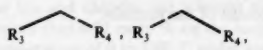
1. A prostaglandin analog of the formula



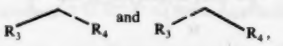
wherein R_8 is hydrogen or hydroxy; wherein Y is trans—CH=CH—, wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, eith the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more that two T's are other than alkyl.

4,108,902

2-DECARBOXY-2-HYDROXYMETHYL-5-OXA-ω-PHENYL-PGA$_1$ OR 9-DEOXY-9,10-DIDEHYDRO-PGD$_1$ COMPOUNDS

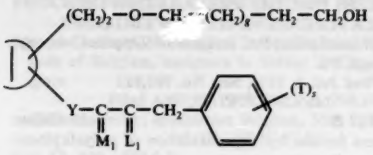
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,025

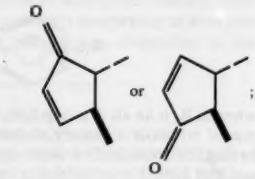
Int. Cl.^{2} C07C *49/84*

U.S. Cl. 260—590 C **39 Claims**

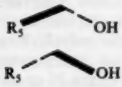
1. A prostaglandin analog of the formula



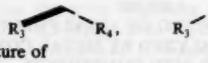
wherein D is



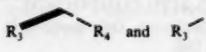
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, eith the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

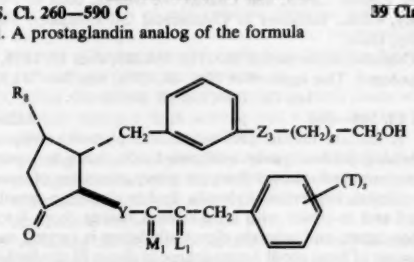
4,108,903

2-DECARBOXY-2-HYDROXYMETHYL-3,7-INTER-M-PHENYLENE-ω-PHENYL-PGD$_1$ COMPOUNDS

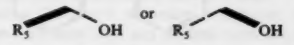
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,037
Int. Cl.[2] C07C *49/82, 49/84*
U.S. Cl. 260—590 C **39 Claims**

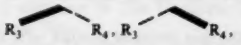
1. A prostaglandin analog of the formula



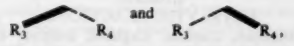
wherein Z_3 is oxa or methylene;
wherein R_8 is hydrogen or hydroxy;
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein *g* is 1, 2, or 3; and
wherein *s* is 0, 1, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of 1 to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

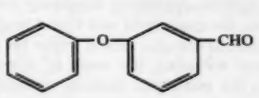
4,108,904

PROCESS FOR THE PREPARATION OF M-PHENOXYBENZALDEHYDE

Dale Gordon Brown, Hopewell, N.J., and William Wayne Brand, Painesville, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

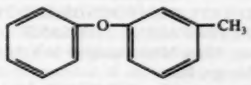
Filed Sep. 22, 1976, Ser. No. 726,017
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—600 R **10 Claims**

1. A process for the preparation of a compound of formula:



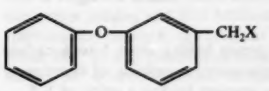
I

comprising halogenating with bromine, chlorine or sulfuryl chloride a compound of formula:



IV

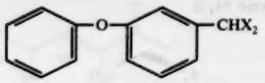
in a solvent of carbon tetrachloride or benzene with 1.2 to 2 molar equivalents of the halogenating agent at about the boiling point of the solvent selected, in the presence of 0.5% to 10% by weight of the formula (IV) compound of a free radical initiator of 2,2'-azobis(2-methylpropionitrile, 2-t-butylazo-2-cyanopropane, lauroyl peroxide or benzoyl peroxide for a period of time sufficient to essentially complete the reaction and obtain a mixture of compounds of formulae:



II

and

-continued



III

wherein X is a bromine or chlorine

reacting the halogenated mixture with 1.0 to 2.0 molar equivalents of hexamethylenetetramine in a solvent of aqueous C_1–C_3 alcohol or aqueous C_2–C_3 alkanoic acid; and

hydrolyzing the thus obtained mixture with a dilute mineral acid.

4,108,905

CATALYTIC REACTIONS

Geoffrey Wilkinson, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Continuation-in-part of Ser. No. 99,501, Dec. 18, 1970, abandoned. This application Jun. 5, 1974, Ser. No. 476,566

Claims priority, application United Kingdom, Dec. 31, 1969, 63503/69; May 22, 1970, 24933/70

Int. Cl.[2] C07C *45/02*

U.S. Cl. 260—604 HF **9 Claims**

1. A process for the production of butyraldehyde by the catalytic hydroformylation of propylene which is characterized by producing normal/iso product ratio of greater than 10:1 by bringing into intimate contact the following reactants a, b, c and d at a temperature and pressure such that they react together to produce the said product;

a. gaseous propylene;

b. hydrogen;

c. carbon monoxide, the hydrogen and carbon monoxide being present in a molar ratio within the range of from 1:15 to 2:1; and

d. a catalytically effective quantity of a hydrido carbonyl complex of rhodium which includes two phosphorus-containing stabilizing donor ligands selected from the group consisting of triphenylphosphine and triphenylphosphite; the improvement in said hydroformylation process consisting essentially of carrying out the said reaction in a rapidly stirred liquid medium consisting of at least one of the said phosphorus-containing stabilizing donor ligands in liquid form, the quantity of said ligand being such that the molar ligand to complex ratio is within the range 200:1 to 5000:1 and including the steps of removing from contact with the said liquid medium a product substantially composed of gaseous butyraldehyde and condensing said product.

4,108,906

HALOGENATED ARYL COMPOUNDS AND PROCESSES FOR PREPARING THE SAME

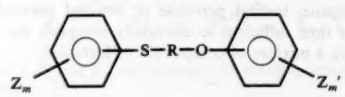
Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, Jun. 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,838

Int. Cl.[2] C07C *149/00*

U.S. Cl. 260—609 R **2 Claims**

1. A halogenated aryl compound having the formula



wherein R is an alkylene group having from 1 to 6 carbon atoms, Z is selected from the group consisting of bromine or chlorine, and *m* and *m'* are integers having a value of 1–5.

4,108,907

PROCESS FOR THE PREPARATION OF POLYALKYLBENZENE HYDROPEROXIDES

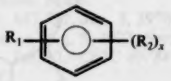
Hans Dressler, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 1, 1976, Ser. No. 701,811

Int. Cl.[2] C07C *179/02*

U.S. Cl. 260—610 B **10 Claims**

1. In a process for the hydroperoxidation of polyalkylbenzenes of the formula:



wherein R_1 is an alkyl group having three to six carbon atoms, one of which is a tertiary carbon; and R_2 is an alkyl group having one to six carbon atoms and *x* is an integer from 1 to 3 and that have a poor solubility in sulfolane, which comprises contacting said polyalkylbenzene in the liquid phase with oxygen or an oxygen-containing gas mixture at a temperature of 75° to 150° C in the presence of sulfolane in an amount of 25 to 150 percent by weight based on the amount of said polyalkylbenzene, the improvement comprising:

(a) contacting said polyalkylbenzene in the liquid phase with oxygen to oxidize the polyalkylbenzene at least by about 10 percent based on the amount of polyalkylbenzene before the addition of the 25 to 150 percent by weight of sulfolane and the continuation of the oxidation in order to effect a homogeneous solution of said polyalkylbenzene and sulfolane at reaction conditions.

4,108,908

OXIDATIVE COUPLING OF ALKYLPHENOLS OR 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF THIO-ACID COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Feb. 18, 1977, Ser. No. 770,008

The portion of the term of this patent subsequent to Jun. 20, 1995 has been disclaimed.

Int. Cl.[2] C07C *27/00, 37/00, 41/00, 45/00*

U.S. Cl. 568—730 **18 Claims**

1. A method of preparing a condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol", by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of sufficient amount of alkaline material to sustain pH in the range of about 7.0–9.0 during the oxidative coupling reaction and a catalyst system comprising a cupric, manganous, cobaltous, or chromic metal complex of a thio acid.

4,108,909

N-ALKYLATED CRESYLIC ACIDS VIA DIRECT ALKYLATION IN A LIQUID PHASE

Bruce Eugene Leach, and Charles M. Starks, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 650,225, Jan. 19, 1976, abandoned. This application Nov. 18, 1976, Ser. No. 742,931

Int. Cl.[2] C07C *39/08, 39/06*

U.S. Cl. 568—766 **7 Claims**

1. A method for the production of a phenolic compound containing predominantly n-alkylated side chains by contacting a compound selected from the group consisting of resorcinol, phenol, isomerized xylenols, hydroquinone, o-cresol, p-cresol and m-cresol with an n-alkanol having from 4 to 10 carbon atoms and wherein direct alkylation is carried out at pressures of from about 1 atmosphere to about 20 atmospheres, temperatures of from about 200° C to about 400° C in the presence of an alumina catalyst derived from aluminum alkoxide hydrolysis.

4,108,910

PROCESS FOR THE STABILIZATION OF METHYLENE CHLORIDE

Marcel Godfroid, Wavre, and Roger Gerkens, Braine-l'Alleud, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Apr. 22, 1977, Ser. No. 790,153
Claims priority, application Belgium, May 3, 1976, 17358
Int. Cl.[2] C07C *17/40*
U.S. Cl. 260—652.5 R 15 Claims

1. Process for the stabilisation of methylene chloride, comprising adding a mixture of stabilisers comprising at least one vicinal epoxide and at least one aliphatic monoether to the methylene chloride.

4,108,911

SELECTIVE HYDROGENATION OF CYCLOPENTADIENE TO FORM CYCLOPENTENE USING RANEY NICKEL CATALYST AND POLYOL REACTANT

Lawson G. Wideman, Akron, and Jay G. Bryson, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 11, 1977, Ser. No. 850,579
Int. Cl.[2] C07C *5/06, 5/16*
U.S. Cl. 260—666 A 5 Claims

1. A process for the preparation of cyclopentene which comprises selectively hydrogenating cyclopentadiene in the liquid phase by contacting cyclopentadiene wih hydrogen in the presence of a hydrogenation catalyst comprising a highly dispersed form of nickel selected from the group consisting of Raney nickel or a modified Raney nickel in which a polyol selected from the group consisting of 1,2-ethanediol, 1,2-propanediol, 1,3-propanediol, 1,2,3-propanetriol, 1,2-butanediol, 1,4-butanediol, 1,3-butanediol, 1,2,4-butanetriol and 1,2,3-propanetriol is employed in the reaction mixture in the volume ratio of the polyol to cyclopentadiene of from 1/1 to 4/1.

4,108,912

TWO-STAGE HYDROGENATION OF BENZENE TO FORM CYCLOHEXANE USING NICKEL CATALYST

Toshisade Takemura; Shohzaburo Sugi; Kenji Nagata, all of Tokuyamashi, and Ryohhei Yahagi, Ichiharashi, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed May 18, 1977, Ser. No. 797,964
Claims priority, application Japan, May 19, 1976, 51-56709
Int. Cl.[2] C07C *5/10*
U.S. Cl. 260—667 1 Claim

1. In the known process for producing cyclohexane by the hydrogenation of benzene in the presence of a catalyst consisting of nickel and nickel oxide supported on diatomaceous earth under hydrogenation conditions, the improvement which comprises

(1) providing two separate multitubular catalytic reaction zones,
(2) filling the first of said catalytic reaction zones with a catalyst having an activity reduced by the treatment of the amount of benzene corresponding to about one-fourth of the amount of benzene treatment,
(3) filling the second of said catalytic reaction zones with a catalyst having a high activity and which has not been subject to the treatment set forth in (2),
(4) passing benzene sequentially through said first catalytic reaction zone and then thru said second catalytic reaction zone until the catalytic activity in said first catalytic reaction zone is reduced to almost zero,
(5) replacing the spent catalyst in said first catalytic reaction zone with highly active catalyst,
(6) passing benzene to be hydrogenated through said second catalytic reaction zone and then through said first catalytic reaction zone until the catalytic activity in said second catalytic reaction zone is reduced to almost zero,
(7) replacing the spent catalyst in said second catalytic reaction zone with highly active catalyst, and
(8) repeating the above sequence of catalyst replacement steps and benzene flow any desired number of times.

4,108,913

DEHYDROGENATION PROCESS

Roger W. Spoerke, Akron, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 23, 1974, Ser. No. 508,478
Int. Cl.[2] C07C *5/38*
U.S. Cl. 260—669 R 16 Claims

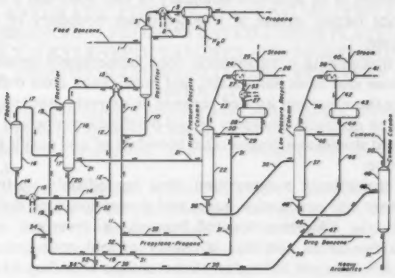
1. A dehydrogenation process which comprises contacting a dehydrogenatable hydrocarbon at dehydrogenation conditions with a catalyst comprising a mixture of (1) at least one metal oxide selected from the group consisting of tungsten oxide, molybdenum oxide and chromium oxide with (2) vanadium oxide, the molar ratio of these oxides of (1) calculated as WO_3, MoO_3, Cr_2O_3 to the V_2O_5 of (2) ranging from 3/1 through 1/3, said mixture having been heated to at least about 600° C. to about 900° C. to react these oxides of (1) and (2) and prior to use, subsequently exposing the product to a reducing agent selected from the group consisting of hydrogen, ammonia, hydrazine, carbon monoxide, methane, ethane, propane and butane at a temperature from about 400° C. to about 800° C. for a period from about 5 minutes to about 8 hours.

4,108,914

AROMATIC HYDROCARBON ALKYLATION PROCESS

Steve A. Gewartowski, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 27, 1977, Ser. No. 791,619
Int. Cl.[2] C07C *3/52*
U.S. Cl. 260—671 R 6 Claims



1. In the process for the production of alkylaromatic hydrocarbons by the alkylation of benzene with an acyclic olefin having from two to five carbon atoms per molecule wherein the olefin is supplied to the process in admixture with a paraffin having the same number of carbon atoms per molecule as the olefin; the olefin, the paraffin and benzene are contacted with an alkylation catalyst in a reaction zone to produce a reaction zone effluent stream comprising benzene, the alkylaromatic hydrocarbon and the paraffin; the reaction zone effluent stream is passed into a first fractionation zone which produces a first bottoms stream comprising benzene, the alkylaromatic hydrocarbon and the paraffin; and said first bottoms stream is passed into a second fractionation zone comprising a recycle fractionation column and wherein benzene is recovered for recycling to the reaction zone and the alkylaromatic hydrocarbon is removed in a bottoms stream; the improvement which comprises passing said first bottoms stream into a first recycle fractionation column, operated at a bottoms temperature of about 480° F. and pressure of about 385 psig effective to produce a net overhead stream consisting essentially of benzene

and substantially all said paraffin in said first bottoms stream and a second bottoms stream comprising benzene and the alkylaromatic hydrocarbon; passing said second bottoms stream into a second recycle fractionation column operated at a bottoms temperature of about 480° F. and a lower pressure than said first recycle fractionation column, generating steam possessing a temperature of about 280° F. by the condensation of overhead vapors removed from said second recycle fractionation column, and withdrawing from said second recycle fractionation column a net overhead liquid stream consisting essentially of substantially pure benzene and a third bottoms stream comprising the alkylaromatic hydrocarbon; and recovering said alkylaromatic hydrocarbon from said third bottoms stream in a third fractionation column.

4,108,915

PROCESS FOR THE SEPARATION OF ETHYLBENZENE

Donald H. Rosback, Elmhurst, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 595,838, Jul. 14, 1975, Pat. No. 4,028,428. This application Sep. 30, 1976, Ser. No. 728,499

Int. Cl.[2] C07C *15/28, 15/30*

U.S. Cl. 260—674 SA **15 Claims**

1. A process for separating ethylbenzene and xylenes from a feed mixture comprising ethylbenzene and a plurality of xylene isomers which process employs an adsorbent comprising a type X or type Y zeolite essentially completely exchanged with strontium cations and which process comprises the steps of:

(a) maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

(b) maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

(c) maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed stream at a downstream boundary of said purification zone;

(d) maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;

(e) passing said feed mixture into said adsorption zone at adsorption conditions to effect the selective adsorption of said xylene isomers to the substantial exclusion of ethylbenzene by said adsorbent in said adsorption zone and withdrawing a raffinate output stream comprising ethylbenzene from said adsorption zone;

(f) passing a desorbent material comprising toluene into said desorption zone at desorption conditions to effect the displacement of said xylene isomers from the adsorbent in said desorption zone;

(g) withdrawing an extract output stream comprising said xylene isomers from said desorption zone; and

(h) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone said feed input stream, a raffinate output stream, desorbent input stream, and extract output stream to effect the shifting of zones through said adsorbent and the production of said extract output and raffinate output stream.

4,108,916

PURIFICATION OF SATURATED HYDROCARBONS

Whitney Harris Mears, Pittsfield, Mass., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 8, 1976, Ser. No. 740,152

Int. Cl.[2] C07C *9/02*

U.S. Cl. 260—676 R **18 Claims**

1. A method of producing a saturated hydrocarbon selected from the group consisting of n-butane, isobutane and propane with less than about 5 parts per million of unsaturated contaminants comprising the steps:

(a) passing a saturated hydrocarbon containing more than about 5 parts per million of unsaturated contaminants through a sulfuric acid scrubber for a length of time sufficient to remove unsaturated contaminants in excess of 5 parts per million, and

(b) passing the outflow from the sulfuric scrubber through a basic demister to remove sulfuric acid mist from the saturated hydrocarbon.

4,108,917

ISOMERIZATION OF TERPENE COMPOUNDS

Freddy Wattimena, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 26, 1977, Ser. No. 836,808

Claims priority, application United Kingdom, Oct. 4, 1976, 41051/76

Int. Cl.[2] C07C *5/26*

U.S. Cl. 260—677 R **9 Claims**

1. A process for the conversion of bicyclic terpene compounds selected from the class consisting of pinane, alpha-pinene, beta-pinene and mixtures thereof into open-chain or acyclic isomers thereof which comprises heating the terpene starting material to a temperature of at least 300° C in the presence of a solid material comprising a metal or metal oxide selected from the class consisting of alkali metals, alkaline earth metals, transition metals and mixtures thereof supported on a carrier having a specific surface area in the range of about 0.01 to about 20 m^2/g.

4,108,918

OXIDATIVE DEHYDROGENATION OF OLEFINS TO DIOLEFINS

Frederic H. Hoppstock, Massillon, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 614,383, Sep. 18, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 779,217

Int. Cl.[2] C07C *11/12*

U.S. Cl. 260—680 E **10 Claims**

1. A process of oxidative dehydrogenation which comprises subjecting at least one hydrocarbon from the group of butene-1, butene-2, 2-methyl-1-butene, 2-methyl-2-butene, 3-methyl-1-butene, n-pentene, 2,3-dimethyl-1-butene, 2,3-dimethyl-2-butene, 2-methyl-1-pentene, 2-methyl-2-pentene, 4-methyl-2-pentene, 3-methyl-1-pentene, 3-methyl-2-pentene and 3-ethyl-1-butene to oxidative dehydrogenation conditions while said hydrocarbons are in the presence of a catalyst consisting essentially of a mixture of cobalt molybdate ($CoMoO_4$) and at least one of chromium oxide (CrO_3 or Cr_2O_3), said catalyst mixture being calcined for at least one hour at 400° to 1100° C. prior to use, in which the relationship of the chromium to cobalt and molybdenum expressed as the atomic ratio of chromium (Cr) to the total of the cobalt and molybdenum (CoMo) ranges from about 0.1/1 to about 5/1.

4,108,919

OXIDATIVE DEHYDROGENATION OF OLEFINS TO DIOLEFINS

Frederic H. Hoppstock, Massillon, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 614,383, Sep. 18, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 779,218

Int. Cl.[2] C07C *11/12*

U.S. Cl. 260—680 E 10 Claims

1. A process of oxidative dehydrogenation which comprises subjecting at least one hydrocarbon from the group of butene-1, butene-2, 2-methyl-1-butene, 2-methyl-2-butene, 3-methyl-1-butene, n-pentene, 2,3-dimethyl-1-butene, 2,3-dimethyl-2-butene, 2-methyl-1-pentene, 2-methyl-2-pentene, 4-methyl-2-pentene, 3-methyl-1-pentene, 3-methyl-2-pentene and 3-ethyl-1-butene to oxidative dehydrogenation conditions while said hydrocarbons are in the presence of a catalyst consisting essentially of a mixture of zinc molybdate ($ZnMoO_4$) and at least one of chromium oxide (CrO_3 or Cr_2O_3), said catalyst mixture being calcined for at least 1 hour at 400° to 1100° C. prior to use, in which the relationship of the chromium to zinc and molybdenum expressed as the atomic ratio of chromium (Cr) to the total of the zinc and molybdenum (ZnMo) ranges from about 0.1/1 to about 5/1.

4,108,920

OLIGOMERIZATION OF OLEFINS

Ji-Yong Ryu, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 645,116, Dec. 29, 1975, Pat. No. 4,048,108. This application Jun. 1, 1977, Ser. No. 802,334

Int. Cl.[2] C07C *3/10*

U.S. Cl. 260—683.15 B 11 Claims

1. A process for the oligomerization of an olefin containing from 3 to 6 carbon atoms which comprises oligomerizing said olefin at oligomerization conditions in the presence of a catalyst which has been prepared by heating a metal oxide which possesses surface hydroxyl groups with hydrogen or nitrogen at a temperature of from about 350° C. to about 550° C., impregnating the thus heated metal oxide with a solution of titanium tetrafluoride, cold rolling the impregnated oxide for a period of time ranging from about 0.5 to about 4 hours, then steam drying the composite at a temperature of about 100° C. and further drying the composite at a temperature in the range of from about 200° to about 600° C. in an inert atmosphere, and thereafter recovering the resultant oligomer.

4,108,921

PROCESS FOR POLYMER LITHIATION IN GRAFT POLYMERIZATION

Arthur W. Langer, Jr., Plainfield, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 562,826, Apr. 28, 1975, which is a continuation of Ser. No. 309,359, Nov. 24, 1972, abandoned and a continuation-in-part of Ser. No. 61,813, Aug. 6, 1970, Ser. No. 60,772, Aug. 3, 1970, Ser. No. 886,008, Dec. 17, 1969, Ser. No. 886,009, Dec. 17, 1969, Ser. No. 690,054, Dec. 13, 1967, and Ser. No. 690,076, Dec. 13, 1967, said Ser. No. 309,359, is a continuation-in-part of Ser. No. 81,181, Oct. 15, 1970, which is a continuation-in-part of Ser. No. 825,384, May 16, 1969, which is a continuation-in-part of Ser. No. 589,240, Oct. 25, 1966, Pat. No. 3,451,988, which is a continuation-in-part of Ser. No. 266,188, Mar. 19, 1963, abandoned, said Ser. No. 61,813, is a continuation-in-part of said Ser. No. 825,384, said Ser. No. 886,008, and said Ser. No. 886,009, each is a division of said Ser. No. 690,054, which is a continuation-in-part of Ser. No. 560,110, Jun. 24, 1966, abandoned, which is a continuation-in-part of Ser. No. 505,976, Nov. 1, 1965, abandoned, which is a continuation-in-part of Ser. No. 359,534, Apr. 3, 1964, Pat. No. 3,458,856, which is a continuation-in-part of said Ser. No. 266,188, said Ser. No. 690,076, is a continuation-in-part of said Ser. No. 560,110, abandoned. This application Aug. 12, 1976, Ser. No. 713,685

Int. Cl.[2] C08F *8/42, 255/06, 283/00, 289/00*

U.S. Cl. 260—827 8 Claims

1. A process for preparing graft polymers which comprises contacting an anionically polymerizable monomer with a polymer-Li•tertiary chelating polyamine complex in which the Li•tertiary chelating polyamine moiety of the complex is attached to carbon atoms of units within the polymer, said units being selected from the group consisting of at least one methyl or methylene radical attached to a nitrogen, silicon, sulfur, phosphorus or oxygen atom.

4,108,922

ANTISTATIC FIBER CONTAINING MULTIPLE BRANCHED PROPOXYLATED-ETHOXYLATED POLYALKYLENEPOLYAMINES AND MONOAMINES AND THEIR CHAIN-EXTENDED REACTION PRODUCTS

Lamberto Crescentini, Chester; Gene Clyde Weedon, Richmond, and Rodney Lee Wells, Chester, all of Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

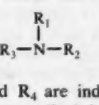
Continuation-in-part of Ser. No. 193,567, Oct. 28, 1971, abandoned, and a continuation-in-part of Ser. No. 239,905, Mar. 31, 1972, abandoned, said Ser. No. 239,905, is a continuation-in-part of Ser. No. 185,816, Oct. 1, 1971, abandoned. This application Oct. 11, 1972, Ser. No. 294,971

Int. Cl.[2] C08L *63/00, 77/00*

U.S. Cl. 260—830 P 14 Claims

1. An antistatic polyamide fiber, said fiber containing between about 1 percent and 12 percent by weight of at least one reaction product of a diepoxide with a branched alkylene amine having a molecular weight above 1,500 said amine selected from the group consisting of compounds represented by the formulas:

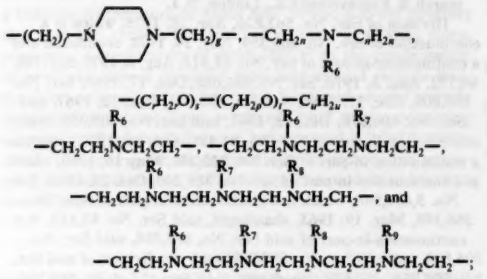
(A)



(B)

where R_1, R_2, R_3 and R_4 are independently selected from monovalent hydrocarbon radicals having 1 to 20 carbon atoms derived from aliphatic, aromatic, cycloaliphatic, aromatic-ali-

phatic, heterocyclic hydrocarbons or $-(C_rH_{2r}O)_m(C_pH_{2p}O)_q-H$; R_5 is at least one of the alkylene difunctional radicals having 2 to 15 carbon atoms and a radical selected from



R_6, R_7, R_8 and R_9 are independently selected from R_1, R_2, R_3, R_4, H or another monovalent hydrocarbon radical having 1 to 20 carbon atoms as defined for R_1, R_2, R_3 and R_4, provided that at least one of R_1, R_2, R_3 and R_4, R_6, R_7, R_8, or R_9 is $-(C_rH_{2r})_m(C_pH_{2p}O)_q-H$, where n is 3 to 6; *r, p* and *u* are 2, 3, or 4; *s, t, m, q* are 0 to 100; $m + q$ must be > 5; *s* and *t* must be < 100; *f, g* are 0 or 2 to 6; were *j* and *k* are each 1 to 250, and said diepoxide being reactive with the end of the moiety $-(C_rH_{2r}O)_m(C_pH_{2p}O)_q-H$ and yieldig a difunctional chain extending radical, said reaction product being predominantly branched, the mole ratio of said diepoxide to said amine (A) and/or (B) being from about 0.7/1.0 to 1.0/1.0

4,108,923

POLY(METHYL METHACRYLATE) COMPOSITION

William C. Mast, Stow; Richard G. Bauer, Kent, and Tom M. Wathen, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 486,149, Jul. 5, 1974, abandoned. This application Sep. 10, 1975, Ser. No. 612,134

Int. Cl.[2] **C08L** *63/00, 51/00*

U.S. Cl. 260—836 **2 Claims**

1. A method of preparing a composition, characterized by having a white light transmission efficiency in the range of about 85 to about 92 percent, a notched Izod impact strength in the range of about 8 to about 30 in. lbs, a flex modulus in the range of about 200,000 to about 300,000 psi, a Shore D hardness in the range of about 75 to about 85, a tensile strength in the range of about 3000 to about 5000 psi, a haze value in the range of about 2 to about 10 percent and a heat distortion temperature in the range of about 180° to about 220° C. (66 psi), which comprises a solid external dispersant phase and a discrete microdispersed solid internal phase, said external and internal phases having individual white light refractive indices within about 1 percent of each other in the range of about 1.45 to about 1.55 at 23° C., which comprises

(A) forming an initial, liquid, external phase dispersant by free radical polymerizing, at a temperature in the range of about 35° to about 85° C., up to about 25 percent and sufficient to form a syrup having a viscosity in the range of about 200 to about 10,000 centistokes at 25° C., a comonomer mixture comprised of about 80 to about 98 weight percent methyl methacrylate and, correspondingly, about 20 to about 2 weight percent of at least one comonomer selected from styrene, vinyl toluene, α-methylstyrene, acrylonitrile and methacrylonitrile,

(B) forming a microdispersion by mixing and dispersing with 100 parts by weight of said liquid, external phase dispersant about 2 to about 15 parts by weight of a crosslinked graft polymer having a particle size in the range of about 0.1 to about 10 microns; where said cross-linked graft polymer is the product of free radical copolymerizing a mixture which comprises

(1) about 92 to about 99.9 weight percent of a mixture comprised of (a) about 50 to about 99 weight percent of at least one monomer selected from the group consisting of methacrylate, 2-ethyl hexyl acrylate and methyl methacrylate and, correspondingly, (b) about 1 to about 50 weight percent of at least one monomer selected from styrene, α-methylstyrene, acrylonitrile and methacrylonitrile and, correspondingly,

(2) about 8 to about 0.1 weight percent of at least one polyfunctional monomer selected from the group consisting of divinylbenzene, allyl methacrylate, glycidyl acrylate, glycidyl methacrylate, triallyl cyanurate, 1,3-butylene dimethacrylate and ethylene glycol dimethacrylate, where in the preparation of the graft polymer, a portion of the acrylate (1-a) is reserved and then added along with additional free radical initiator after the polymerization of the initial monomers (1-a) and (1-b).

4,108,924

STABILIZED CHLORINE-CONTAINING RESIN COMPOSITION

Katsuo Akagane, Ashiya; Teruho Adachi, and Kunimasa Kamio, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 25, 1976, Ser. No. 661,553

Claims priority, application Japan, Feb. 26, 1975, 50-24334

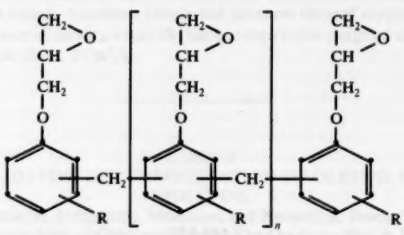
Int. Cl.[2] **C08K** *5/15*

U.S. Cl. 260—837 PV **6 Claims**

1. A composition comprising

A. a rigid chlorine-containing polymer selected from the group consisting of (1) a homopolymer of vinyl chloride, (2) a homopolymer of vinylidene chloride, (3) a copolymer of vinyl chloride or vinylidene chloride with ethylene, propylene, acrylonitrile, styrene, a vinyl ester, a vinyl ether, a vinylidene halide, methyl methacrylate, a dialkyl fumarate or a dialkyl maleate, and (4) an ethylene-vinyl acetate polymer or ethylene-alkyl acrylate polymer having vinyl chloride or vinylidene chloride grafted thereon, and

B. a novolac type epoxy compound of the formula



wherein R is hydrogen or a $C_1 - C_4$ alkyl group in the position ortho or para to the epoxy group, and *n* is a number of from 5 to 15, **the weight ratio of the epoxy compound to** 100 parts by weight of the chlorine-containing polymer being 0.03 to 10 parts by weight.

4,108,925

THERMOPLASTIC MOLDING COMPOSITIONS OF RUBBER MODIFIED COPOLYMERS OF A VINYL AROMATIC COMPOUND AND AN α,β-UNSATURATED CYCLIC ANHYDRIDE

Gim Fun Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 527,140, Nov. 25, 1974. This application Nov. 19, 1975, Ser. No. 633,418

Int. Cl.[2] **C08L** *51/04, 51/06, 51/08*

U.S. Cl. 260—876 R **8 Claims**

1. A thermoplastic molding composition which comprises: (a) from 40–95 parts by weight of a rubber modified copoly-

mer of a vinyl aromatic compound and an α,β-unsaturated anhydride; and

(b) from 5–60 parts by weight of an emulsion graft polymerization pproduct of an acrlic monomer alone or in admixture with a styrene monomer on a rubbery diene homopolymer or styrene-diene copolymer backbone.

4,108,926

REACTIVE PLASTICIZER FOR THERMOPLASTIC POLYSULFONE RESINS

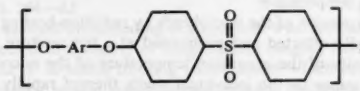
Fred E. Arnold, Centerville; Gerard A. Loughran, Kettering, both of Ohio, and Anthony Wereta, Jr., Sunny Vale, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 28, 1976, Ser. No. 736,287

Int. Cl.² C08L *29/10, 49/00, 51/08, 81/06*

U.S. Cl. 260—874 **3 Claims**

1. A composition consisting essentially of a polyphenylsulfone thermoplastic having repeating units of the formula



wherein Ar is a divalent aromatic radical; and a plasticizing amount of 4,4'-bis(3-ethynylphenoxy)diphenylsulfone.

4,108,927

METHOD OF MAKING LEAD SHOT

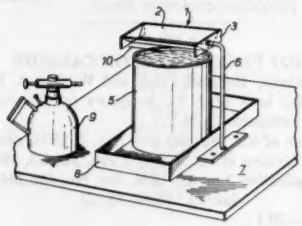
James A. Francis, 5 Chakola Ave., Hornsby Heights, 2077 Sydney, N.S.W., Australia; Brian G. Francis, 24 Grove St., Raunds, Northamptonshire, and Frederick L. Francis, 1 Bedford Rd., Rushden, Northamptonshire, both of England

Filed May 13, 1976, Ser. No. 686,241

Claims priority, application United Kingdom, May 13, 1975, 20100/75

Int. Cl.² B01J *2/06*

U.S. Cl. 264—13 **4 Claims**



1. A method of making lead shot which comprises allowing molten lead to pass through apertures in the base of a container and fall therefrom as molten droplets into a bath of cold water disposed not more than about 2 inches vertically below the container, and solidifying the molten droplets in the cold water to form shot, wherein the droplets fall from the base of the container through a heating zone disposed between the base of the container and the said bath where the droplets are heated and assume a close to perfectly spherical shape before entering the bath, wherein the droplets are heated in the heating zone by a flame of burning gas disposed laterally across the path of the falling droplets so that the droplets pass through the flame before entering the cold water.

4,108,928

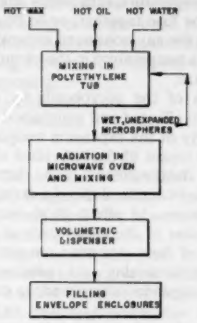
METHOD OF PRODUCING A VISCOUS FLOWABLE PRESSURE-COMPENSATING FITTING COMPOSITION FROM HOLLOW THERMOPLASTIC MICROBLENDS WITH THE USE OF HIGH FREQUENCY HEATING AND DISPENSING THE COMPOSITION INTO A SEALABLE, FLEXIBLE, PROTECTIVE ENCLOSURE MEANS

Jack C. Swan, Jr., Boulder, Colo., assignor to Hanson Industries Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 663,213, Mar. 2, 1976, abandoned. This application Sep. 16, 1976, Ser. No. 723,912

Int. Cl.² B29D *27/00*

U.S. Cl. 264—26 **54 Claims**



1. The method of rapidly heat-expanding by radiation-heating in liquid medium, discrete, hollow, expandable microbeads having a thermoplastic resinous shell and thermally-responsive blowing agent contained therein, to effect good, nondestructive, rapid expansion of the microbeads, which comprises:

(a) preparing a selectively vented, expansion system of said microbeads in a temperature-compensating liquid medium having first and second different liquid materials not identically susceptible to heating in the presence of a high frequency electrical field,

(i) said first liquid material is characterized by readily absorbing high frequency electrical energy from a heat-generating, high frequency electrical field and by having and thereupon radpily reaching a prevailing boiling point within said system in the vicinity of the expansion temperature of said microbeads and which, upon being rapidly boiled and essentially escaping by being vented from the system, effects a cooling action on the microbeads,

(ii) said second liquid material is characterized by having a prevailing boiling point within said system in excess of that of said first liquid material and providing within the system and upon said venting of first liquid material from the system, a heat sink for the microbeads, and

(iii) said expandable microbeads being characterized by sufficiently absorbing high frequency energy from a heat-generating, high frequency electrical field so as to be heated, followed by the heated microbeads being subjected to said cooling action effected by first liquid material being rapidly boiled and vented from the system, followed by the heated microbeads being subjected to said heat sink provided by said second liquid material;

(b) subjecting said system to radiation-heating by a heat-generating, high frequency electrical field of frequency and duration sufficient to rapidly expand said microbeads within the system while said first and second liquid materials maintain the temperature of the microbeads contained therein in the vicinity of their expansion temperature, so that said radiation-heating effectively heats said liquid medium and microbeads within the system, whereupon said first liquid material rapidly attains its prevailing boiling point in the vicinity of the expansion temperature of the heated microbeads, said first liquid material rapidly boils and essentially escapes by being vented from the

system and thereby effects a cooling action on the heated microbeads and consequently maintains their temperature in the vicinity of their expansion temperature, the liquid medium remaining and present in the system during the rapid vented escape of first liquid material having a substantially constant temperature, and said second liquid material remains in the system following said vented escape of first liquid material and consequently maintains the temperature of the heated microbeads in the vicinity of their expansion temperature by effecting a cooling action on heated microbeads by providing a heat sink which prevents heated microbeads contained therein from being heated to a temperature sufficiently high so as to cause them to melt or fuse together, or to be destroyed, while also providing for any continued expansion of the heated microbeads at a temperature in the vicinity of their expansion temperature;

said expansion of the microbeads by radiation-heating being rapidly effected and maintained at a temperature in the vicinity of the expansion temperature of the microbeads by means of the individual shells thereof rapidly being heat-softened and thermally-responsive blowing agent contained therein exerting an expanding pressure thereon, to effect good, but nondestructive, rapid expansion of the microbeads at a temperature in the vicinity of their expansion temperature; and,

(c) selectively discontinuing said radiation-heating to provide said heat-expanded microbeads in the resultant liquid medium.

41. The method of producing and dispensing into sealable, flexible, protective enclosure means, viscous, flowable, pressure-compensating fitting composition having therein, a discontinuous phase of discrete, lightweight, sturdy, resilient, hollow, thermoplastic, resinous, in situ heat-expanded microbeads formed by rapidly heat-expanding by radiation-heating in liquid medium, discrete, hollow, expandable microbeads having a thermoplastic resinous shell and thermally-responsive blowing agent contained therein, which method comprises:

(a) preparing a selectively vented, expansion system of discrete, hollow, expandable microbeads having a thermoplastic resinous shell and thermally-responsive blowing agent contained therein, wherein said microbeads are in a temperature-compensating liquid medium having first and second different liquid materials not identically susceptible to heating in the presence of a high-frequency electrical field,

(i) said first liquid material comprises water and is characterized by readily absorbing high frequency electrical energy from a heat-generating, high frequency electrical field and by having and thereupon rapidly reaching a prevailing boiling point within said system in the vicinity of the expansion temperature of said microbeads and which, upon being rapidly boiled and essentially escaping by being vented from the system, effects a cooling action on the microbeads,

(ii) said second liquid material comprises a member of the group consisting of (1) oil and (2) oil and wax, and is characterized by having a prevailing boiling point within said system in excess of that of said first liquid material and providing within the system and upon said venting of first liquid material from the system, a heat sink for the microbeads, and

(iii) said expandable microbeads being characterized by sufficiently absorbing high frequency energy from a heat-generating, high frequency electrical field so as to be heated, followed by the heated microbeads being subjected to said cooling action effected by first liquid material being rapidly boiled and vented from the system, followed by the heated microbeads being subjected to said heat sink provided by said second liquid material;

(b) subjecting said system to radiation-heating by a heat-generating, high frequency electrical field of frequency and duration sufficient to rapidly expand said microbeads within the system while said first and second liquid materials maintain the temperature of the microbeads contained therein in the vicinity of their expansion temperature, so that said radiation-heating effectively heats said liquid medium and microbeads within the system, whereupon said first liquid material rapidly attains its prevailing boiling point in the vicinity of the expansion temperature of the heated microbeads, said first liquid material rapidly boils and essentially escapes by being vented from the system and thereby effects a cooling action on the heated microbeads and consequently maintains their temperature in the vicinity of their expansion temperature, the liquid medium remaining and present in the system during said vented escape of first liquid material having a substatantially constant temperature, and said second liquid material remains in the system following the rapid vented escape of first liquid material and consequently maintains the temperature of the heated microbeads in the vicinity of their expansion temperature by effecting a cooling action on heated microbeads by providing a heat sink which prevents heated microbeads contained therein from being heated to a temperature sufficiently high so as to cause them to melt or fuse together, or to be destroyed, while also providing for any continued expansion of heated microbeads at a temperature in the vicinity of their expansion temperature;

said expansion of the microbeads by radiation-heating being rapidly effected and maintained at a temperature in the vicinity of the expansion temperature of the microbeads by means of the individual shells thereof rapidly being heat-softened and thermally-responsive blowing agent contained therein exerting an expanding pressure thereon to effect good, but nondestructive, rapid expansion of the microbeads at a temperature in the vicinity of their expansion temperature;

(c) selectively discontinuing said radiation-heating to provide said heat-expanded microbeads in second liquid material and thereupon producing pressure-compensating fitting composition which is characterized by having a viscous, flowable, continuous phase comprising wax and oil, and having therein, a discontinuous phase of discrete, lightweight, sturdy, resilient, hollow, thermoplastic, resinous, in situ heat-expanded microbeads;

(d) delivering said fitting composition to volumetric dispensing means at an elevated temperature sufficient to facilitate its flow to and from said dispensing means; and,

(e) selectively dispensing a desired volume of said fitting composition from said dispensing means into sealable, flexible, protective enclosure means.

4,108,929

HOT PRESSED SILICON CARBIDE

Svante Prochazka, Ballston Lake, and William J. Dondalski, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 503,008, Sep. 3, 1974, abandoned, which is a division of Ser. No. 378,918, Jul. 13, 1973. This application Jun. 11, 1976, Ser. No. 695,246

Int. Cl.[2] **C04B** *35/52*

U.S. Cl. 264—29.1 **7 Claims**

1. A method of making a hot-pressed silicon carbide ceramic body containing elemental carbon only in the form of minute particles interspersed throughout said body, said body having a density of at least 98% of theoretical density and having

improved high temperature mechanical properties comprising the steps of

(a) forming a substantially homogeneous dispersion consisting essentially of a submicron powder of silicon carbide, a boron additive selected from the group consisting of boron and boron carbide, wherein the amount of the boron additive is equivalent to about 0.3–3.0% by weight of boron, and about 0.5 to 3.0% by weight of elemental carbon, and

(b) hot pressing the dispersion in an inert atmosphere at a temperature of about 1,900°–2,000° C. and at a pressure of about 5,000–10,000 psi for a sufficient time ranging from about 10 minutes to about 60 minutes to produce said hot-pressed silicon carbide body.

4,108,930
HIGH-ALUMINA CEMENT

Oliver W. Crinkelmeyer, Tulsa, and Earl F. Morris, Wagoner, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 431,270, Jan. 7, 1974, Pat. No. 3,922,172. This application Jul. 1, 1974, Ser. No. 484,497

Int. Cl.[2] E02D *29/10*

U.S. Cl. 264—32 **4 Claims**

1. A method of cementing in a borehole wherein the cement is subjected to a variety of temperatures ranging from below about 32° F to above freezing temperatures which comprises:

cementing in said borehole employing a hydraulic cement slurry comprising, as percent by weight,

(a) a high-alumina cement,

(b) calcium sulfate from about 5 to about 30 percent, based on the weight of high-alumina cement,

(c) water, from about 35 to about 50 percent based on the total weight of (a) and (b), and

(d) a halide salt selected from the group consisting of NaCl or KCl, from about 5 to about 15 percent, based on the weight of water.

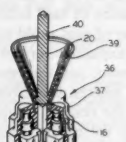
4,108,931
SYSTEM OF MAKING MOLDS FOR INVESTMENT CASTING

Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Continuation of Ser. No. 541,230, Jan. 15, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,514

Int. Cl.[2] B29C *1/02, 29/00*

U.S. Cl. 264—37 **12 Claims**



7. The method of making a multiple cavity mold for investment casting utilizing a sprue form and plurality of patterns each formed with a gate section, said method comprising:

forming the patterns and the gate sections from, and coating the exterior of the sprue form with, a mixture of polyethylene glycol having a molecular weight that is at least in the range having as the lower limit approximately 1,300 to approximately 1,600 and having as the upper limit 15,000 to 20,000, and powdered graphite, wherein the graphite comprises in the range of from approximately 35 to approximately 60 percent by weight of the mixture,

adhering the gate sections of the patterns to the sprue form coating at a location on the sprue form spaced from one end of the sprue form and in a uniform spacing about the sprue form,

encasing the said patterns and sprue form, to the exclusion of said sprue form one end, with mold forming material to form an investment mold whereby said one end of the sprue form is exposed from the thus formed mold,

heating the sprue form by applying heat to said one end thereof to melt the sprue form coating,

removing the sprue form from the mold to define the mold sprue opening and expose the portions of the respective pattern gate sections, that were adhered to the sprue form coating, to the resulting mold sprue opening,

water leaching the gate sections and the respective patterns from the mold at room temperature, to form in the mold its investment cavities and a channel for each such cavity communicating between the respective cavities and the mold sprue opening,

and drying the mold.

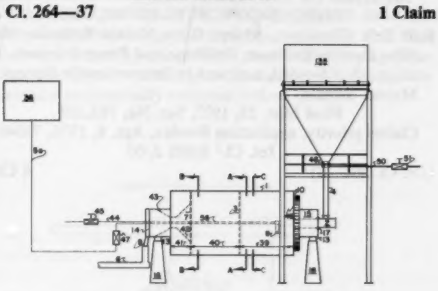
4,108,932
METHOD OF AGGLOMERATING POWDERS

Robert B. Takewell, Borger, Tex.; Paul W. Brandon, Havre de Grace, Md., and Paul R. Odom, Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 663,424, Mar. 3, 1976, abandoned, which is a continuation of Ser. No. 450,013, Mar. 11, 1974, abandoned, which is a division of Ser. No. 186,113, Oct. 4, 1971, Pat. No. 3,803,283. This application Mar. 4, 1977, Ser. No. 774,281

Int. Cl.[2] B01J *2/12*

U.S. Cl. 264—37 **1 Claim**



1. A method of agglomerating finely divided clays into pellets with a packing density greater than 60 lbs/ft^3, said method comprising the steps of:

(a) introducing finely divided clay having a moisture content of about 1.5 to 5% by weight into one end of a rotating cylindrical drum having an inlet end, an axis of rotation, and a discharge end and tumbling said material therein;

(b) contacting said tumbling clay with a liquid wetting agent in said drum wherein said clay begins to curl back and tumble down the side of said rotating drum;

(c) spraying said liquid wetting agent at said curl in the form of a spray having an angle that the spray makes with a vertical line through the axis of rotation of said drum in the range of 35° to 85° and a spray angle and an angle of inclination, as shown at (23) and (24) of FIGS. 6*a* and 6*b* respectively of said drawings, of about 30°;

(d) continuing rotation of said drum at a speed below the critical speed RS_c, defined by

$$RS_c = 76.6/\sqrt{D}$$

wherein D is the diameter of the drum in feet, to form pellets having a size range exhibiting maximum effective packing density of from about 60 to 70 pounds per cubic foot; and

(e) removing pellets that would pass through a tight-mesh screen from near the discharge end of said rotating drum

and discharging said pellets into the incoming stream of finely divided clay at the inlet end of said rotating drum to provide seeds and nuclei for pellet initiation;

(f) removing pellets that would not pass through a large-mesh screen from near the discharge end of said rotating drum, grinding said pellets, and discharging said pellets into the incoming stream of finely divided clay at the inlet end of said rotating drum to provide seeds and nuclei for pellet initiation;

(g) discharging pellets from said drum that would pass through a large-mesh screen, but would not pass through a tight-mesh screen, such pellets having a packing density greater than 60 lbs/ft^3,

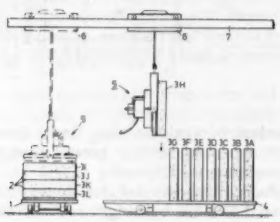
wherein the tight-mesh screen and the large-mesh screen are defined to produce a pelleted clay consisting of compacted pellets of varying sizes which efficiently utilize available voids in the arrangement of closely packed uniform spherical pellets comprising a gradation of pellets with from 25 to 55% of the pellets being retainable on a 5 mesh screen, from 30 to 55% of the pellets being retainable on a 10 mesh screen but capable of passing through a 5 mesh screen, from 5 to 25% of the pellets being retainable on a 20 mesh screen but capable of passing through a 10 mesh screen, 0.5 to 5% of the pellets being retainable on a 40 mesh screen but capable of passing through a 20 mesh screen, and less than 2% of the pellets capable of passing through a 40 mesh screen.

4,108,933

METHOD OF MANUFACTURING STEAM-CURED POROUS CONCRETE PRODUCTS

Rolf Erik Göransson, Åkarp; Gösta Harald Eriksson, Södertälje; Øystein Kalvenes, Grödinge, and Percy Svensson, Rönninge, all of Sweden, assignors to Internationella Siporex AB, Malmo, Sweden

Filed Mar. 28, 1977, Ser. No. 782,219
Claims priority, application Sweden, Apr. 6, 1976, 7604016
Int. Cl.^{2} B20B *3/00*
U.S. Cl. 264—42 **4 Claims**



1. A method of manufacturing steam-hardened cellular concrete slabs comprising the steps:

(a) molding from a concrete mass a cellular body of at least approximately parallelepipedic shape that in a certain stage of solidification of the mass is self-supporting but still capable of being cut into regular pieces,

(b) making a plurality of vertically spaced, horizontally extending cuts in said body while the same is resting on a first support to thereby divide said body into a plurality of slab-forming slices,

(c) removing said slices one-by-one by lifting away from said first support the body slice that from time-to-time is the uppermost one,

(d) canting said lifted slices and depositing them in succession in their canted position in side-by-side but mutually spaced relationship on a second support, so that their broad sides are exposed for subsequent steam contact, and

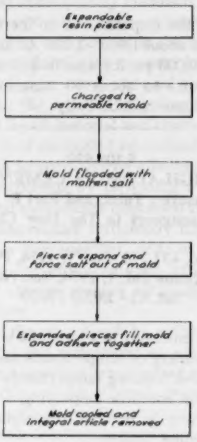
(e) forwarding said second support with the canted body slices thereon into an autoclave, in which the slices are subsequently steam-hardened to form the desired slabs.

4,108,934

MOLDING EXPANDABLE THERMOPLASTIC RESINS

Louis C. Rubens, and Willard E. Alexander, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 23, 1976, Ser. No. 669,551
Int. Cl.^{2} B29D *27/00*
U.S. Cl. 264—53 **14 Claims**


Expandable resin pieces
Charged to permeable mold
Mold flooded with molten salt
Pieces expand and force salt out of mold
Expanded pieces fill mold and adhere together
Mold cooled and integral article removed

1. A method of making shaped articles of organic polymer resins having a cellular structure by molding heat-expandable thermoplastic resin in a mold having a mold cavity, which comprises charging into the mold cavity a heat-expandable normally solid thermoplastic resin material comprising a normally solid thermoplastic resin component and a blowing agent, said resin material being in the form of discrete pieces or segments, and flooding the mold cavity and the said pieces or segments of resin material therein with a molten salt, which salt melts to a stable liquid and is maintained at a temperature which is above the softening and expansion temperatures of said resin material and wherein said resin component is self-supporting at the molten salt temperature, and wherein the mold walls defining the mold cavity are permeable to the flow therethrough of fluids but not of the resin therein, said pieces or segments of said heat-expandable resin material being charged to the mold cavity in amount capable of free expansion at the temperature of said molten salt to volume at least 110% of the volume of said mold cavity, whereby said pieces or segments of said expandable resin material are heated by the molten salt and expand, and the resulting expanding pieces or segments force the molten salt from the mold cavity and adhere together, and the resulting expanded cellular resin material substantially fills the cavity, then cooling the mold and the resulting shaped article therein and removing from the mold the resulting integral shaped article of resin having a cellular structure.

4,108,935

METHOD FOR FORMING SOLID FRICTION MATERIAL STRUCTURES

Edward Moneghan, Hatboro, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 18, 1975, Ser. No. 633,054
Int. Cl.^{2} B29C *3/04*
U.S. Cl. 264—68 **18 Claims**

1. A method of producing molded bodies of friction material, such as brake pads and brake blocks, which comprises the steps of:

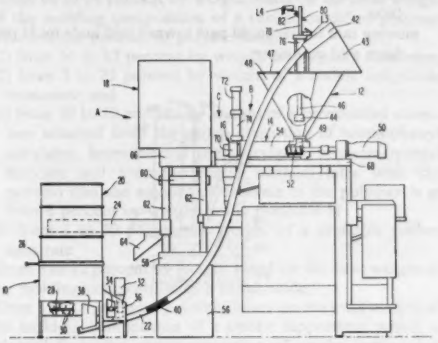
a. mixing predetermined quantities of dry friction material including asbestos fibers, thermosetting resin powder and

friction modifying particles to obtain a supply of light and fluffy, dry homogeneously mixed ingredients.

b. withdrawing said mixed ingredients from said supply,

c. moving said withdrawn mixed ingredients along a closed path, initial movement of said mixed ingredients after withdrawal being through a closed mechanical conveyor portion of said closed path, to an incremental charge measuring and forming position;

d. applying heat and pressure to said moving mixed ingredients along a portion of said closed path to effect partial



plasticization thereof so said mixed ingredients reach said incremental charge measuring and forming position as a partially plasticized flow of uniform density, capable of being molded, but only if such molding is performed within a predetermined time;

e. measuring and forming successive separate incremental charges from said partially plasticized flow;

f. molding said incremental charges, within said predetermined time, under heat and pressure to form precured molded bodies of friction material; and

g. curing said precured molded bodies under heat.

4,108,936

PROCESS FOR DYEING WET-SPUN AROMATIC POLYAMIDES IN GEL FORM

Gerhard Dieter Wolf; Ralf Miessen; Hans Egon Kunzel, all of Dormagen, and Francis Bentz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 7, 1975, Ser. No. 602,676

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1974, 2438545

Int. Cl.[2] D06P 5/00; B01D 47/06

U.S. Cl. 264—78 **10 Claims**

1. A process for the production of dyed filaments of aromatic polyamides which comprises continuously dyeing wet-spun gel filaments of an aromatic polyamide which is not modified with acid or basic groups before, during, or after stretching, in an aqueous bath containing at least one cationic or anionic water-soluble dye in dissolved form.

4,108,937

METHOD OF MAKING HOLLOW ARTICLES FROM PLASTIC MATERIAL

Pierre Martineu, and Jean-Francois Gregoire, both of Chalon-sur-Saone, France, assignors to Carnaud Total Interplastic, Chalon-sur-Saone, France

Filed Feb. 20, 1976, Ser. No. 659,975

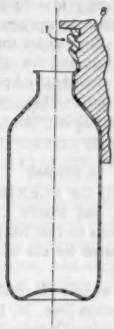
Claims priority, application France, Feb. 20, 1975, 75 05251; Aug. 6, 1975, 75 24499

Int. Cl.[2] B29C 17/07

U.S. Cl. 264—89 **2 Claims**

1. A process of manufacturing biaxially oriented hollow bodies from an elongated, generally cylindrical amorphous crystalline thermoplastic polyester parison which includes a neck part from which a neck is to be formed, comprising the steps of:

expanding said parison in a preform mold to form a preform while keeping said preform in an amorphous condition and then axially stretching said preform, including said neck part, at a temperature greater than, but close to, the glass transition temperature, to cause a substantial de-



crease in the diameter thereof, and expanding the preform, to an extent sufficient to cause biaxial orientation of the preform,

solidifying said preform in the biaxially oriented state and then thermostabilizing said preform,

and then deforming said preform at a temperature greater than, but close to, the glass transition temperature to produce said biaxially oriented hollow body.

4,108,938

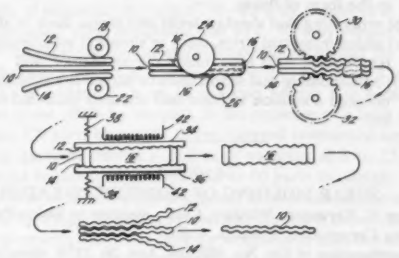
METHOD FOR SHAPING A PLASTIC MEMBRANE

Solomon Rosenblatt, Montclair, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jul. 19, 1976, Ser. No. 706,793

Int. Cl.[2] B27J 5/00

U.S. Cl. 264—127 **13 Claims**



1. A method for shaping a plastic membrane, comprising the steps of:

placing the membrane between two covering layers, thereby forming a three layer composite;

applying forces to the composite to reshape it; and

setting the reshaped membrane to cause it to retain its new shape while it remains part of the composite.

4,108,939
POROUS POLYMERIC BEARING

Clifford Wilhelm Anderson, Pine Island; Kenneth John Mack, Lake City, and Jerry Thomas Martin, Plainview, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

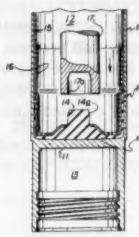
Filed Jun. 21, 1976, Ser. No. 698,381
Int. Cl.² C08L 61/06
U.S. Cl. 264—129 **17 Claims**

1. An antifriction bearing in which at least the material forming the bearing surface comprises at least two heterogenous interlocked phases of irregular shape; one of said phases being polyphenylene sulfide and the other being a cured phenolic resin; the presence of said cured phenolic resin providing highly interconnected voids within such compounded structure adaptable for impregnation with a liquid lubricant.

4,108,940
COLD MOLDING OF FLEXIBLE ARTICLES

Jacques Ratté, Ste-Foy, and Pierre Carignan, Charlesbourg, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Continuation-in-part of Ser. No. 663,995, Mar. 4, 1976, abandoned. This application Dec. 28, 1976, Ser. No. 754,960
Claims priority, application Canada, Feb. 6, 1976, 245228
Int. Cl.² B29D 3/02
U.S. Cl. 264—140 **15 Claims**



7. A method of manufacturing an uncured, flexible head-end insulator for use in the propellant chamber of a rocket motor, said method comprising the steps of:

(a) forming a sheet material comprising about 20 to 50% by weight of a substantially uncured carboxyl-terminated polybutadiene binder having dispersed therethrough an asbestos reinforcing material in an amount of from about 80% to about 50% by weight, at least about half of said reinforcing material being in fibrous form and the balance in the form of floats;

(b) processing said sheet material into strips, discs or shreds;

(c) maintaining said strips, discs or shreds at sufficiently low temperature to at least inhibit curing thereof; and

(d) cold-molding said strips, discs or shreds in a substantially uncured condition to form said uncured head-end insulator.

4,108,941
SHEAR MOLDING OF REINFORCED LATCH

Gary H. Kermoian, Whittier, Calif., assignor to Dolco Packaging Corporation, Burbank, Calif.

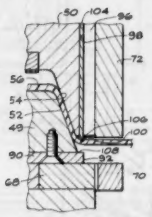
Continuation of Ser. No. 680,248, Apr. 26, 1976, abandoned. This application Jun. 16, 1977, Ser. No. 807,263
Int. Cl.² B29C 17/08
U.S. Cl. 264—154 **9 Claims**

1. In the shear molding of a container by forming a softened sheet of organic polymer material between male and female mold parts, in which said sheet is introduced between male and female mold parts arranged to close, said mold parts having male and female die surfaces respectively in confronting relation and shaped to define the contours of the surfaces of said container upon closure of said molds, the improvement for forming a latch opening and a reinforced area adjacent thereto in one operation, said improvement comprising:

releasably disposing at the exterior of said male mold part in the region of said latch opening a vertical flat die face forming a backwall for the path of travel of said sheet thereon;

releasably disposing above said backwall a vertically reciprocable shear member with a flat surface confronting said flat die face, and an anterior end portion formed as a die face;

moving said female mold part toward said male mold part to form said container;



sliding said shear member vertically past said die face and spaced therefrom, but at a distance less than the thickness of said sheet so as to separate a portion only of said sheet without sliding contact between said shear member and die face, said portion being spaced from all edges of said sheet so as to form an opening through said sheet;

carrying said separated sheet portion and proximate adjacent portions of said sheet away from said opening in a downward direction; and

compressing said separated sheet in a region defined by the anterior end portion of said shear member and opposite die surfaces to reinforce and to add strength and rigidity to a portion of the container structure adjacent said latch opening.

4,108,942
POLYPHENYLENE POLYMERS AND METHODS FOR MAKING THE SAME

Alan J. Chalk, Scotia, and Alfred R. Gilbert, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1972, Ser. No. 237,169
Int. Cl.² C08F 4/66, 38/00
U.S. Cl. 260—875 **3 Claims**

1. The process for making polyphenylene polymers which comprises polymerizing, in the presence of a titaniumaluminum catalyst of the formula $TiCl_4/Al(C_2H_5)_2Cl$ made by the reaction of $Al(C_2H_5)_2Cl$ and $TiCl_4$ in a molar ratio of from 1.5 to 5 mols of the $Al(C_2H_5)_2Cl$ per mol of the $TiCl_4$, (a) a phenyl acetylene compound selected from the class consisting of phenyl acetylene and m-tolyl acetylene and (b) diethynyl benzene, whereby from 25 to 75% by weight of the phenyl acetylene compound is first interacted with the diethynyl benzene in the presence of the titanium-aluminum catalyst, and the remainder of the phenyl acetylene compound is added after the aforesaid initial reaction.

4,108,943

RUBBER MODIFIED FIRE RETARDANT POLYMER COMPOSITIONS

Yoon C. Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 644,492, Dec. 29, 1975, Pat. No. 4,048,263. This application Jul. 5, 1977, Ser. No. 812,557
Int. Cl.[2] C08L *23/00*
U.S. Cl. 260—878 R 10 Claims

1. A polymeric molding composition comprising:

(a) from 48 to 94 percent by weight based on the total weight of the molding composition of a rubber modified polymer which is the product of polymerizing:

(1) from 55 to 85 percent by weight of a styrene monomer;

(2) from 5 to 25 percent by weight of a maleic anhydride monomer; and

(3) from 10 to 20 percent by weight of a brominated monomer selected from the group consisting of bromophenyl acrylates, bromophenyl methacrylates, bromoneopentyl acrylate and bromoneopentyl methacrylates with the proviso that the amount of bromine in the polymer is at least 6 percent by weight in the presence of

(4) from 1 to 30 percent by weight of a graftable rubber substrate

(b) from 3 to 12 percent by weight based on the total weight of the molding composition of a metal oxide;

(c) from 3 to 25 percent by weight based on the total weight of the molding composition of a smoke suppressant which is selected from the group consisting of smoke suppressing hydrates, carbonates and borates; and

(d) from 0 to 15 percent by weight of a brominated aromatic fire retardant additive.

4,108,944

METAL SALTS OF MODIFIED ANHYDRIDE RESIN

James J. Tazuma, Stow, and Mario D. Zadra, Barberton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 699,910, Jun. 24, 1976, Pat. No. 4,071,669. This application Sep. 22, 1977, Ser. No. 835,615
Int. Cl.[2] C08F *8/42*
U.S. Cl. 260—879 8 Claims

1. A metal salt of an anhydride-modified resin prepared by the method which comprises reacting in an aqueous medium (A) about 0.4 to about one equivalent of a water soluble salt selected from chlorides and nitrates of metals selected from zinc, aluminum, lead and cobalt and one equivalent of (B) the sodium or potassium salt of the acid of said anhydride modified resin, where said resin acid salt is prepared by reacting an aqueous solution of a hydroxide selected from at least one of sodium hydroxide and potassium hydroxide with said anhydride-modified resin where said anhydride-modified resin is comprised of about 45 to about 55 mole percent units derived from maleic anhydride and, correspondingly, about 55 to about 45 mole percent units derived from a piperylene/methyl branched monoolefin backboned resin comprising about 40 to about 70 weight percent units derived from piperylene and correspondingly about 60 to about 30 weight percent units derived from at least one methyl branched chain α or β monoolefin containing 4 to 6 carbon atoms, where the weight ratio of piperylene to said branched monoolefin is in the range of about 0.8/1 to about 2/1, where said anhydride modified resin is prepared by the method which comprises the steps of (1) reacting about 30 to about 60 parts by weight maleic anhydride or reacting about 10 to about 25 parts by weight maleic anhydride if an organo peroxide catalst is used at a temperature in the range of about 150° to about 250° C with 100 parts by weight of a basic hydrocarbon-derived resin having a softening point in the range of about 10° to about 50° C. prepared by polymerizying in the presence of a catalyst selected from boron trifluoride etherate, a monomer mixture which comprises about 40 to about 70 weight present piperylene, and correspondingly, about 60 to about 30 weight percent of at least one monoolefin selected from methyl branched chain α or β monoolifins containing 4 to 6 carbon atoms, where the weight ratio of piperlene to said branched chain monoolefin is about 0.8/1 to about 2.0/1 and (2) removing unreacted maleic anhydride, if any, preferably by distillation.

4,108,945

STAR POLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Lewis J. Fetters, and Le-Khac Bi, both of Akron, Ohio, assignors to The University of Akron, Akron, Ohio

Continuation of Ser. No. 488,676, Jul. 15, 1974, Pat. No. 3,985,830. This application Mar. 3, 1976, Ser. No. 663,541
The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.
Int. Cl.[2] C08F *297/04*
U.S. Cl. 260—880 B 7 Claims

1. A star polymer product comprising:

a nucleus having a plurality of molecules of a linking compound selected from the group consisting of aliphatic and aromatic diisocyanates, and aliphatic and aromatic diepoxides, diketones and dialdehydes having up to about 12 carbon atoms;

at least ten polymeric arms linked to said nucleus wherein said polymeric arms are formed from conjugated dienes and the ratio of molecules of linking compound to the number of polymeric arms in said star polymer is at least 6:1; and

characterized in that:

the number average molecular weight of said star polymer product is at least 500,000 and the intrinsic viscosity thereof ranges from about 0.1 to about 2.0 dl/gm.

4,108,946

GRAFT-POLYMER COMPOSITION OF RUBBER FOR REINFORCING CROSSLINKED RESIN

Kazumasa Kamada; Ryoji Handa, both of Ohtake; Norihisa Kusakawa, Yamaguchi, and Keita Yamamoto, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 10, 1973, Ser. No. 358,932
Claims priority, application Japan, May 15, 1972, 47-047823
Int. Cl.[2] C08L *51/00, 33/00*
U.S. Cl. 260—881 3 Claims

1. A thermoplastic graft polymer composition excellent in weather and impact resistance and appearance which is obtained by emulsion-graft-polymerizing 5 to 1,900 parts by weight of monomer mixture of 10 – 90% by weight of at least one aromatic vinyl compound and 90 to 10% by weight of at least one ethylenically unsaturated compound having the general formula $CH_2 = CRX$, wherein R is H or CH_3, and X is CN or $COOR_1$ where R_1 is an alkyl group having 1 to 4 carbon atoms (total 100% by weight), in the presence of a latex containing 100 parts by weight of two-layered crosslinked acrylic rubber particles having a degree of swelling of 3 to 15 and obtained by seed-polymerizing 70 to 90 parts by weight of a mixture of 60% by weight or more of at least one acrylic ester, 39.9% by weight or less of at least one monomer copolymerizable therewith and 0.1 to 10% by weight of at least one crosslinking monomer having at least two non-conjugated C = C bonds (total 100% by weight), in the presence of 30 to 10 parts by weight (solids) of a latex (particle size 0.04 to 0.24μ) of a crosslinked rigid resin having a glass transition temperature of at least 50° C and a decomposition temperature of at least 240° C and consisting of 40 to 70% by weight of styrene, 15 to 50% by weight of methyl-methacrylate, 10 to 30% by weight of acrylonitrile, and 0.01 to 3% by weight of a crosslinking monomer.

4,108,947

THERMOPLASTIC ELASTOMER COMPOSITION

Kazuo Kimura; Masao Hirano; Isao Sugita, and Ryuzo Fujita, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1976, Ser. No. 679,973
Claims priority, application Japan, Apr. 30, 1975, 50-51421
Int. Cl.[2] C08L 9/00, 23/00, 47/00
U.S. Cl. 260—889 13 Claims

1. A thermoplastic elastomer composition consisting essentially of (A) 2 to 50% by weight of a polybutadiene having a 1,2-addition unit content of 70% or more and an intrinsic viscosity [η] of 0.7 dl/g or more as measured in toluene at 30° C, (B) 20 to 90% by weight of at least one olefinic rubber selected from the group consisting of random ethylene-propylene copolymer and random ethylene-propylene-non-conjugated diene copolymer and (C) 5 to 60% by weight of a polyolefin resin, 30 to 95% by weight of the total polymer components, up to 90% by weight of said polybutadiene and up to 90% by weight of said olefinic rubber being soluble in 1,2,3,4-tetrahydronaphthalene when the composition is heated at 210° C for 3 hours in 1,2,3,4-tetrahydronaphthalene under reflux.

4,108,948

COMPATIBILIZATION OF THERMOPLASTIC COPOLYMERS

Ervin G. Pritchett, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 794,786
Int. Cl.[2] C08L 23/08
U.S. Cl. 260—897 B 29 Claims

1. A method for the compatibilization of materials normally incompatible with each other which comprises mixing (a) a thermoplastic copolymer of an alkenyl aromatic monomer and an alkenyl nitrile monomer, (b) a thermoplastic copolymer of ethylene and a vinyl ester having a melt flow rate less than about one measured according to ASTM D-1238, Condition E, in the presence of a compatibilization effective amount of (c) an acid compatibilization agent prior to, concurrently with, or subsequent to, mild-crosslinking of copolymer (b) for a period of time sufficient to achieve compatibilization of copolymer (a) and (b).

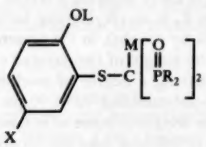
4,108,949

O-HYDROXY (ALKOXY) PHENYLTHIOMETHYLENE DI(ORGANOPHOSPHORUS) COMPOUNDS AND PROCESS FOR MAKING SAME

Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1977, Ser. No. 756,507
Int. Cl.[2] C07F 9/32, 9/50
U.S. Cl. 260—932 13 Claims

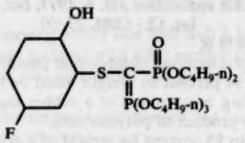
1. As a composition of matter,



where
L is H or R',
R' is alkyl of 1 to 6 carbon atoms,
M is H, Cl or Br
X is Br, Cl, F, CF_3, NO_2, CN, CO_2R', SO_2R',or

and
R is phenyl, alkyl of 1 to 3 carbon atoms, or OR'.

9. Process for preparation of tetrabutyl (2-butoxy-5-fluorophenylthio)methylenediphosphonate which comprises heating the compound



at a temperature of 125° C to 200° C.

4,108,950

PROCESS FOR PREPARING ORGANOPHOSPHORUS AND ORGANOPHOSPHONO FLUORINES

Joseph Epstein, Baltimore, and George T. Davis, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 29, 1977, Ser. No. 792,427
Int. Cl.[2] C07F 9/14; A01N 9/36
U.S. Cl. 260—986 5 Claims

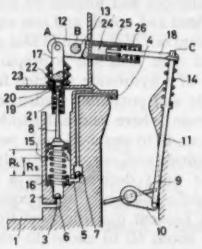
1. A process for preparing toxic organophosphorus-fluorine and organophosphono-fluorine compounds in situ comprising the step of mixing a phosphorus ester selected to produce a corresponding organophosphorus-fluoridate, in an aprotic solvent with a solution of tetraethylammonium fluoride in said solvent to produce a low concentration solution of anticholinesterase active organophosphorus-fluoridate.

4,108,951

ACCELERATOR PUMP SYSTEM

Takao Niwa; Mamoru Yoshioka, and Takao Tate, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 2, 1977, Ser. No. 773,548
Claims priority, application Japan, Dec. 28, 1976, 51-157418
Int. Cl.[2] F02M 7/08
U.S. Cl. 261—34 B 3 Claims



1. An accelerator pump assembly for delivering fuel to an engine carburetor which includes a throttle valve, said assembly comprising flow means for delivering fuel through said pump assembly into said carburetor, a rocker arm assembly having a first and a second end, said rocker arm assembly being pivotally mounted at a point intermediate said ends, connecting rod means interconnecting said first end of said rocker arm assembly with said throttle valve of said carburetor to effect pivotal movement of said rocker arm assembly about said intermediate pivot point in response to movement of said throttle valve, a pump plunger assembly mounted to extend from said second end of said rocker arm assembly and reciprocally movable through an injection stroke in response to movement of said throttle valve to inject fuel through said flow means

into said carburetor, first thermally responsive means interposed between said intermediate pivot point of said rocker arm assembly and said first end thereof to expand and contract the distance therebetween in response to ambient temperature, and second thermally responsive means interposed as part of the length of said plunger assembly to expand and contract said length thereof by which said plunger assembly extends from said second end of said rocker arm assembly in response to ambient temperature thereby to alter the injection stroke of said plunger assembly, said first and said second thermally responsive means altering the stroke characteristics of said pump plunger assembly in response to ambient temperature conditions thereby to adjust the quantity of fuel injected into said carburetor in accordance with changes in ambient temperature.

4,108,952

VARIABLE VENTURI TYPE ENGINE CARBURETOR

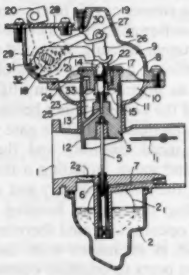
Suminari Iwao, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1977, Ser. No. 789,456

Claims priority, application Japan, Apr. 23, 1976, 51-51186[U]

Int. Cl.[2] F02M *9/06*

U.S. Cl. 261—44 R **10 Claims**



1. A variable venturi type carburetor comprising, in combination:

(a) a carburetor main body;

(b) an air intake passageway formed in said carburetor main body;

(c) a piston type throttle valve provided in the air intake passageway and which also serves as a variable venturi;

(d) a pressure receiving part provided on the upper part of said throttle valve, and having a function of opening the throttle valve upon receipt thereinto of an intake negative pressure of the engine;

(e) control means for opening and closing the throttle valve which is supported on the rotational shaft within said pressure receiving part, and restricts said throttle valve to a predetermined degree of opening by closing and opening the valve in association with the throttle valve operation; and

(f) compulsory valve opening means interposed between said throttle valve and said throttle valve control means interlocked with the valve operation, said compulsory valve opening means following movement of said control means for opening and closing the throttle valve, and having a function of forcibly opening said throttle valve from its lowest degree of opening to a predetermined degree of opening when said control means moves toward the throttle valve opening direction.

4,108,953

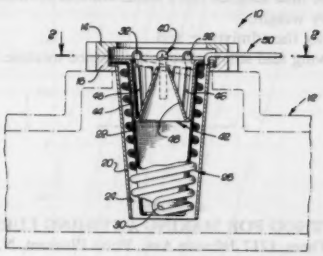
FUEL VAPORIZING DEVICE

Andrew Rocco, 21207 S. Avalon, Space 194, Carson, Calif. 90745

Continuation-in-part of Ser. No. 683,325, Jul. 19, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,194

Int. Cl.[2] F02M *23/12, 31/12*

U.S. Cl. 261—142 **8 Claims**



1. In a fuel vaporizing device for installation between a carburetor and an intake manifold of an internal combustion engine with the device extending into the intake manifold, the combination of:

(a) a heat conducting tubular housing having an open, upper inlet end and an open, lower outlet end;

(b) means for mounting said housing between the carburetor and the intake manifold of the engine with the housing extending downwardly into the intake manifold;

(c) a heat conducting screen within and coaxial with and substantially parallel to said housing, there being an annular space between said housing and said screen;

(d) a heat conducting helical coil within said annular space and coaxial with said housing and said screen, said helical coil being in contact with said screen and spaced radially inwardly from said housing; and

(e) means for heating said helical coil.

4,108,954

PROCESS OF PRODUCING SHAPED STRUCTURES OF CROSSLINKED ELASTOMERIC POLYURETHANE

Karl Heinz Hilterhaus, Georgsmarienhutte, Oesede, and Franz Gottfried Reuter, Lemforde, both of Germany, assignors to Chemie-Anlagenbau Bischofsheim GmbH, Osnabruck and Reuter Technologie GmbH, Lemforde, both of Germany

Filed Nov. 10, 1975, Ser. No. 630,491

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1974, 2459757

Int. Cl.[2] B29D *7/02*; C08G *18/08, 18/32*

U.S. Cl. 264—216 **19 Claims**

1. A process for producing crosslinked elastomeric shaped polyurethane structures from crosslinked polyurethanes dissolved in solvents, comprising

(a) providing an NCO pre-adduct dissolved in a solvent;

(b) providing a solution of solvent and at least one agent selected from the group of crosslinking agents and chain propagating agents, said at least one agent being selected from the group consisting of hydrazines, hydrazine derivatives, diamines, and polyols, with the proviso that, if only two hydrogen atoms active according to Zerewitinov are present in these agents, an agent must be additionally used which contains at least three hydrogen atoms of different activities according to Zerewitinov;

(c) continuously admixing the NCO pre-adduct solution into the solution of at least one agent selected from the group consisting of crosslinking agents and chain propagating agents over a period of time during which the viscosity is constantly measured, until the viscosity is within a range where the addition of smaller and smaller amounts of

NCO pre-adduct solution results in an ever growing rise in viscosity;

(d) terminating the addition of said pre-adduct solution when the viscosity of the admixture has reached a level at which the addition of even the minutest amount of NCO pre-adduct solution would result in instantaneous gelling, the NCO pre-adduct solution being added in an amount such that the final solution has a solids content between 15 and 35% by weight;

(e) shaping the admixture; and

(f) removing said solvent from the shaped mixture.

4,108,955

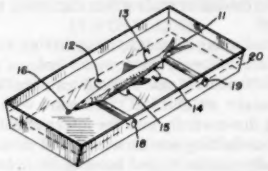
METHOD FOR MAKING A FISHING LURE

Joseph R. Thom, 1217 Johnson Ave., Point Pleasant, N.J. 08742

Filed Mar. 21, 1977, Ser. No. 779,626

Int. Cl.[2] B29C *5/00*; B29D *3/00*

U.S. Cl. 264—222 **7 Claims**



1. A method for making a fishing lure comprising the steps:

pouring mold material into a mold form to provide a lower part of a mold;

embedding a specimen of a bait fish partially into said mold material in said lower part of said mold;

embedding hooks of a given shape in the surface of said lower part of said mold adjoining said specimen of bait fish;

embedding an eye of a given size adjoining the head of said specimen of bait fish;

embedding at least one rod within said lower part of said mold between said bait fish and one of the edges of said mold;

pouring additional mold material into said mold form to cover all of the elements embedded in said lower part of said mold, and to provide an upper part of said mold;

allowing said mold material to harden or set;

separating said upper part of said mold from said lower part of said mold;

removing said specimen of bait fish, said hooks, said eye, and said rods from said mold;

positioning a series of inserts comprising hooks of said given shape, and eye of said given size, with suitable interconnecting means, in the respective cavities in said mold;

clamping said upper part of said mold to said lower part of said mold;

positioning said mold so that a cavity in said mold formed by one of said rods is pointing upwards;

pouring molding material into said mold through said cavity in said mold formed by said one of said rod cavities until said mold cavities are filled;

allowing said molding material to harden;

separating said upper and said lower parts of said mold;

removing said molded fishing lure from said mold;

cutting off any projections from said rod portions of said mold to produce a finished fishing lure.

4,108,956

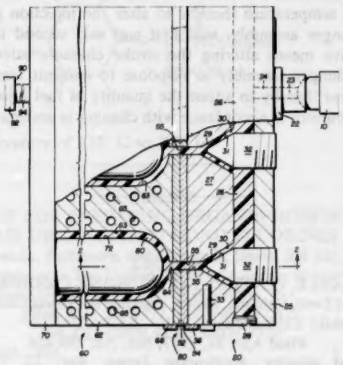
INJECTION MOLDING METHOD AND APPARATUS

Soo-Il Lee, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 21, 1977, Ser. No. 761,095

Int. Cl.[2] B29F *1/03, 1/08*

U.S. Cl. 264—329 **15 Claims**



1. In an injection molding assembly: a heated runner housing having a sprue opening to receive plasticized material under pressure from an injection head, a plurality of branch runner lines, and a transverse runner cavity interconnecting the sprue opening with the branch runner lines; a cooled mold assembly adjacent the heated runner housing, the mold assembly including mold sections defining a plurality of mold cavities, with each cavity having an injection port in alignment with the branch runner lines of the heated runner housing, the improvement of: a composite, laminated, slidable gate valve interposed between the cooled mold assembly and the heated runner housing, said laminated valve including a thermally conductive layer contacting the mold assembly and a thermally insulating layer contacting the runner housing, the gate valve having a plurality of openings formed therethrough which are selectively positioned in alignment with the branch runner lines and the injection ports to establish communication therebetween to accommodate the flow of heated plastic material from the heated runner housing into the cooled mold assembly, displacement means selectively moving the slidable gate valve to align the valve openings with the branch lines and mold injection ports and to displace the valve openings from such alignment to block the flow of plastic material into the mold cavities; the composite gate valve being effective to thermally segregate the cooled mold cavity from the adjacent heated runner housing in order to (1) facilitate the cooling of the molded article, (2) reduce cycle time, and (3) prevent the formation of a cold plastic slug in the runner housing.

12. In a method of forming a plastic article by injection molding, the steps of:

(a) injecting heated, flowable plastic material under pressure from a delivery port in a heated runner housing, through a flow passageway in a composite slidable gate valve, and into a sprue opening of an internal mold cavity of a cooled mold assembly, the slidable gate valve being interposed between the heated runner housing and the cooled mold assembly, and said composite valve comprising a layer of insulating material contacting the heated runner housing and a layer of heat conductive material contacting the cooled mold assembly;

(b) displacing the slidable gate valve in a direction essentially perpendicular to the direction of plastic flow from the runner housing to the mold cavity thereby displacing the flow passageway in the gate valve out of alignment with the delivery port and the sprue opening to block plastic flow;

(c) simultaneously (i) cooling the plastic material within the mold cavity and (ii) heating additional plastic material within the runner housing; and

(d) during the performance of steps (a)–(c), (i) thermally segregating the adjacent heated runner housing and the cooled mold assembly by use of the insulating material layer of the slidable gate valve and (ii) cooling the material in the sprue opening by the conductive material layer of the slidable gate valve.

4,108,957

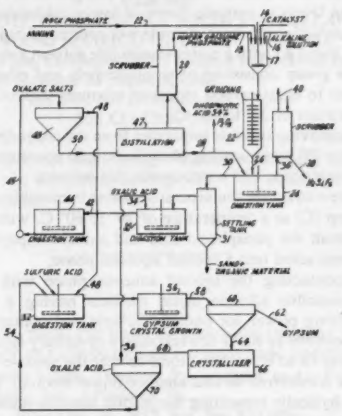
METHOD FOR MANUFACTURE OF PHOSPHORIC ACID FROM PHOSPHATE ROCK

Robert Michel, c/o Toren, McGeady and Stanger P.C., 521 Fifth Ave., New York, N.Y. 10017

Continuation-in-part of Ser. No. 665,330, Mar. 9, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,855

Int. Cl.[2] C01G *43/00*

U.S. Cl. 423—3 **15 Claims**



1. A method for the manufacture of phosphoric acid from phosphate rock comprising

(a) mixing crushed phosphate rock with a stoichiometric excess of phosphoric acid in the presence of water to form a slurry and heating the slurry at a temperature and for a period of time sufficient to convert the rock into a calcium monophosphate;

(b) adding oxalic acid to the heated slurry to form a slurry of precipitated calcium oxalate therein; and

(c) recovering the phosphoric acid from the slurry resulting from step (b).

4,108,958

EXTRACTION OF CU(II), FE(III), NI(II), CO(II), CD(II), ZN(II), CA(II) AND MG(II) METAL VALUES USING 2-HYDROXY IMINOACETIC ACIDS

Riekert Kok, and Abraham J. van der Zeeuw, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

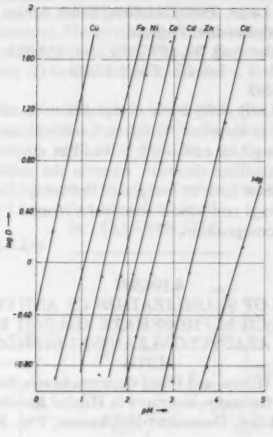
Division of Ser. No. 723,115, Sep. 14, 1976, abandoned. This application Jul. 15, 1977, Ser. No. 816,108

Claims priority, application United Kingdom, Sep. 18, 1975, 38379/75

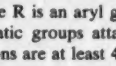
Int. Cl.[2] C01G *3/00, 9/00, 51/00, 53/00*

U.S. Cl. 423—24 **6 Claims**

1. In the process of selectively extracting at least one metal value of the group consisting of copper (II), iron (III), nickel (II), cobalt (II), cadmium (II), zinc (II), calcium (II) and magnesium (II) from an acidic aqueous medium using an organic solvent and a complexing agent at a pH between about 0.0 and about 4.5, separating organic and aqueous layers and extracting the metal ions from the organic layer with a mineral acid



solution, the improvement which consists of using as the complexing agent a compound having the formula



where R is an aryl group having between 1 and 3, inclusive, aliphatic groups attached thereto, where the total aliphatic carbons are at least 4.

4,108,959

PROCESS FOR TREATING A WASTE GAS

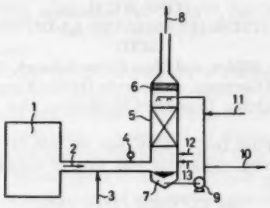
Atsushi Tatani; Setsuo Omoto, and Yoshihiro Shiraishi, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jul. 29, 1977, Ser. No. 820,383

Claims priority, application Japan, Aug. 2, 1976, 51-91334

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—240 **7 Claims**



1. A process for treating a waste gas containing SO_2 and HCl which comprises determining the amount of HCl in said waste gas and supplying at least one magnesium salt selected from the group consisting of $MgSO_4$, $MgSO_3$, MgO, $MgCO_3$ and $Mg(HSO_3)_2$ in an amount corresponding to the amount of HCl, and additionally supplying $CaCO_3$ or $Ca(OH)_2$ as an absorbent for SO_2 to a column for treating said waste gas.

4,108,960
COMPOSITIONS CONTAINING DITHIONITES

Roland Albert Leigh, Port Elizabeth, South Africa, assignor to BOC Limited, London, England

Filed Aug. 30, 1976, Ser. No. 718,613
Int. Cl.² C01B *17/66*
U.S. Cl. 423—265 **2 Claims**

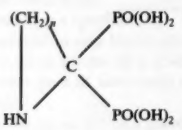
1. An essentially anhydrous composition containing metal dithionite and at least one aromatic carbonyl compound selected from the group consisting of vanillin, ethyl vanillin and benzoin as a stabilizer therefor, wherein the metal dithionite constitutes at least 50% by weight of the composition and the aromatic carbonyl compound constitutes from 0.1% to 5% by weight of the composition.

4,108,961
PROCESS OF STABILIZATION OF ANHYDROUS DIBASIC CALCIUM PHOSPHATE AGAINST FLUORINE IONS WITH AZACYCLOALKANE-2,2-DIPHOSPHONIC ACIDS

Walter Plöger, Hilden, and Claus Gutzschebauch, Neuss, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 1, 1975, Ser. No. 636,736
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1974, 2456808
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—265 **5 Claims**

1. A process for stabilizing anhydrous dibasic calcium phosphate against reaction with fluorine ions consisting essentially of suspending anhydrous dibasic calcium phosphate in an aqueous medium at a pH of from 5 to 10, containing from 0.01% to 5% by weight based on the content of dibasic calcium phosphate of an azacycloalkane-2,2-diphosphonic compound selected from the group consisting of (A) compounds of the formula



wherein *n* is an integer from 3 to 5, and (B) water-soluble salts thereof, and separating said stabilized anhydrous dibasic calcium phosphate.

4,108,962
PROCESS OF STABILIZATION OF ANHYDROUS DIBASIC CALCIUM PHOSPHATE AGAINST FLUORINE IONS WITH 3-AMINO-1-HYDROXYPROPANE-1,1-DIPHOSPHONIC ACID

Walter Plöger, Hilden, and Claus Gutzschebauch, Neuss, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 1, 1975, Ser. No. 636,737
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1974, 2456693
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—265 **5 Claims**

1. A process for stabilizing anhydrous dibasic calcium phosphate against reaction with fluorine ions consisting essentially of suspending anhydrous dibasic calcium phosphate in an aqueous medium at a pH of from 5 to 10, containing from 0.01% to 5% by weight based on the content of dibasic calcium phosphate of a diphosphonic compound selected from the group consisting of (A) 3-amino-1-hydroxypropane-1,1-diphosphonic acid, and (B) water-soluble salts thereof, and separating said stabilized anhydrous dibasic calcium phosphate.

4,108,963
PROCESS FOR PURIFYING PHOSPHORIC ACID

Jean-Pierre Cuer, Colombes, and Antoine Floreancig, Mitry Mory, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 586,712, Jun. 13, 1975, abandoned. This application May 16, 1977, Ser. No. 797,181
Claims priority, application France, Jun. 25, 1974, 74 22031
Int. Cl.² C01B *25/16*
U.S. Cl. 423—321 S **13 Claims**

1. A method for purifying crude wet-process phosphoric acid containing at least one of vanadium or chromium as anionic metallic complexes which comprises, in combination:

(A) treating crude wet-process phosphoric acid with sufficient amounts of a sulfide or metallic iron in aqueous medium to convert said anionic complexes of high oxidation levels to cationic forms of lower oxidation levels;

(B) extracting the treated crude wet-process phosphoric acid of Step (A) with a water-immiscible solvent selected from the group consisting of monoalcohols and ethers having four to eight carbon atoms or mixtures thereof at a temperature of 20° to 60° C.;

(C) removing cationic impurities from the treated medium of Step (B) by separating phosphoric acid containing anionic impurities in the water-immiscible solvent;

(D) re-extracting the separated water-immiscible solvent of Step (C) at a temperature of 20° to 60° C. with water to permit the phosphoric acid and anionic impurities to be reextracted into a second aqueous phase;

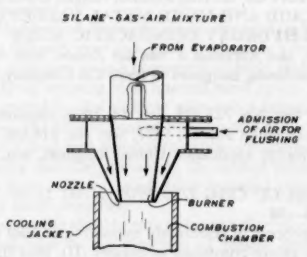
(E) contacting the second aqueous phase with a water-immiscible alkaline liquid medium having a poor dissolving power for phosphoric acid and containing from about 5% to 100% of a secondary or tertiary amine having from 18 to 60 carbon atoms so that the anionic impurities are transferred to said alkaline liquid medium; and

(F) physically separating the second aqueous phase containing purified phosphoric acid.

4,108,964
PROCESS FOR THE MANUFACTURE OF SILICON DIOXIDE

Günter Kratel, Durach-Bechen; Ernst Mühlhofer, Durach, and Franz Schreiner, Sulzberg, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,502
Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620737
Int. Cl.² C01B *33/12*
U.S. Cl. 423—336 **5 Claims**



1. A process for the manufacture of highly disperse silicon dioxide by reacting gaseous organosilane and other gases that burn to form water other than gaseous organosilane and with

oxygen-containing gases in a flame which comprises the steps of:

evaporating the organosilane in such a manner that the level of liquid organosilane is held constant, at a vapor pressure of 0.2 to 1.2 atmospheres gage and at most at a temperature of 45° above the boiling point of the particular organosilane,

maintaining the temperature of the vapor until mixing with said other gases and said oxygen-containing gases occurs,

metering the gas mixture resulting from the mixing through a cone-shaped inlet into a combustion chamber,

flushing oxygen-containing gases through means surrounding the inlet into the combustion chamber, and

indirectly but positively cooling said combustion chamber.

4,108,965

$(NF_4)_2NiF_6$ HIGH ENERGY SOLID PROPELLANT OXIDIZER AND METHOD OF PRODUCING THE SAME

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 15, 1976, Ser. No. 732,623

Int. Cl.² C01G *53/00*

U.S. Cl. 423—351 **4 Claims**

1. An improved, high energy, fluorine containing oxidizer consisting of a compound having NiF_6^{--} as an anion, and an energetic cation.

4,108,966

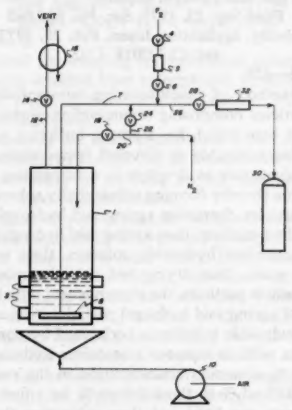
PREPARATION OF IODINE PENTAFLUORIDE BY DIRECT FLUORINATION OF MOLTEN IODINE

John Theodore Lileck, Tamaqua, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Oct. 26, 1977, Ser. No. 845,695

Int. Cl.² C01B *7/24*

U.S. Cl. 423—466 **8 Claims**



1. A process for producing iodine pentafluoride from iodine and gaseous fluorine which comprises contacting said fluorine with iodine in a molten state in a reaction zone maintained at a temperature in the range of about 114° to 280° and at a pressure in the range of about 160 to 7,600 kilopascals to effect a reaction between said fluorine and molten iodine and recovering the resulting iodine pentafluoride.

4,108,967

PROCESS FOR PREPARING SULPHUR HEXAFLUORIDE

Joachim Massonne, Hanover, and Wilfried Becher, Heilbronn-Neckargartach, both of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

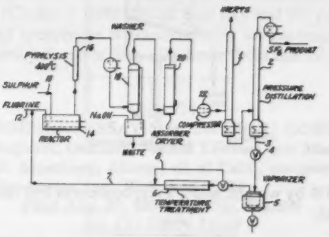
Division of Ser. No. 550,159, Feb. 14, 1975, Pat. No. 4,039,646. This application Jun. 15, 1977, Ser. No. 806,674

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1974, 2407492

The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.

Int. Cl.² C01B *17/45*

U.S. Cl. 423—469 **9 Claims**



1. In a process for the production of sulphur hexafluoride SF_6 including the steps of reacting fluorine and molten sulphur, whereby a mixture of SF_6 together with higher- and lower-boiling by-products is produced, removing said lower-boiling by-products from said mixture, and separating a portion of said SF_6 from said higher boiling by products, whereby a residue of said SF_6 containing a minor portion of higher-boiling by-products results, the improvement comprising the step of recycling said residue back to said reacting step.

4,108,968

CONTROL OF PURITY AND PARTICLE SIZE IN PRODUCTION OF ALUMINUM CHLORIDE

Stanley C. Jacobs, Lower Burrell, Pa.; Larry K. King, Maryville, Tenn., and Bernard J. Racunas, New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 765,458, Feb. 3, 1977, abandoned. This application Jul. 21, 1977, Ser. No. 817,822

Int. Cl.² C01F *7/58*

U.S. Cl. 423—495 **3 Claims**

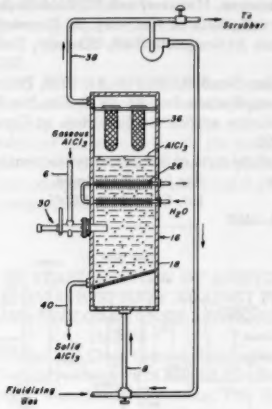
1. In the process for the production of aluminum chloride having a particle size range and purity suitable for subsequent electrolytic reduction to metallic aluminum by the chlorination of a material containing a compound of aluminum wherein other chlorides are also formed which must be separated from the aluminum chloride prior to said electrolytic reduction, the improvement in purity control and particle size control which comprises:

(a) passing gaseous aluminum chloride at a temperature of about 250° C into a fluidized bed of aluminum chloride particles at an entrance velocity of from 18 meters/second to 90 meters/second;

(b) condensing aluminum chloride in the fluidized bed at a temperature of 60°–80° C; and

(c) removing particles of condensed aluminum chloride from a point adjacent the bottom of the fluidized bed

thereby providing particles of aluminum chlorides characterized by a particle size range of 1–500 microns, a purity of at



least 99.5% by weight, and a $TiCl_4$ content of less than 0.008% by weight.

4,108,969

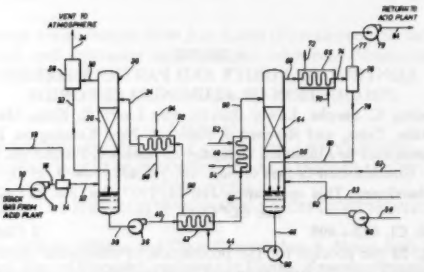
PROCESS FOR THE REMOVAL OF SO_2 FROM A STACK GAS, ABSORPTIVE MEDIUM FOR USE IN PROCESS AND PROCESS FOR PREPARING THE ABSORPTIVE MEDIUM

George G. Merkl, 46 Sunset Ct., Haworth, N.J. 07641

Division of Ser. No. 598,170, Jul. 22, 1975, Pat. No. 4,012,487, which is a continuation-in-part of Ser. No. 346,772, Apr. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 86,364, Nov. 2, 1970, abandoned, Continuation-in-part of Ser. No. 515,311, Oct. 16, 1974, abandoned, which is a continuation of Ser. No. 238,290, Mar. 27, 1972, abandoned. This application Jul. 27, 1976, Ser. No. 708,940

Int. Cl.² C01F *7/68*

U.S. Cl. 423—560 **9 Claims**



1. A process for producing an absorptive medium capable of removing quantities of SO_2 from gas streams which comprises:

contacting activated aluminum with SO_2 gas in an aqueous medium at a pH between about 0.5 and 4.0 and at a temperature between about 40° F and 120° F until a solution is formed having a specific gravity between about 1.05 and 1.5; and thereafter

removing any unreacted aluminum and precipitated or suspended material from said soltuion;

said activated aluminum having been formed by wetting substantially pure aluminum with a second metal selected from the group consisting of mercury, indium, gallium and alloys of indium/gallium in the presence of a source of protons selected from aqueous acid solutions and aqueous alkaline solutions until at least the surface layer of said aluminum has been permeated with said second metal.

4,108,970

PROCESS FOR PRODUCING LITHIUM NIOBATE AND LITHIUM TANTALATE

Albert Anthony Ballman, Woodbridge, and Murray Robbins, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 21, 1976, Ser. No. 707,718

Int. Cl.² C01G *33/00, 35/00;* C01D *15/00*

U.S. Cl. 423—593 **4 Claims**

1. A process for synthesizing double oxide compounds with nominal formula $LiMO_3$ in which M is selected from the group consisting of niobium and tantalum, comprising the steps of

(a) dissolving suitable lithium compound selected from the group consisting of lithium methoxide and lithium ethoxide and M compounds selected from the group consisting of M methoxide, M ethoxide, M pentafluoride, M pentachloride and M pentabromide in an organic solvent consisting essentially of at least one alcohol selected from the group consisting of ethanol and methanol, said lithium and M compounds dissolved in an organic solvent in approximately equally molar amounts,

(b) adding this solution to an alcohol-base solution consisting essentially of at least one alcohol with 3 or 4 carbon atoms and at least one basic compound selected from the group consisting of ammonia, quaternary ammonium salts, organic amines with up to 10 carbon atoms and heterocyclic nitrogen basic compounds said addition resulting in coprecipitate mixed hydroxide compound,

(c) separating and drying the resulting coprecipitate mixed hydroxide compound,

(d) heating the separated and dried coprecipitate to a temperature between 500° and 800° C so as to convert the hydroxide compound to the double oxide compound.

4,108,971

METHOD OF MANUFACTURE OF SPHERICAL ALUMINA PARTICLES

Shizuo Takumi, Kamakura; Toshio Hashimoto, and Masaru Tatsushima, both of Isehara, all of Japan, assignors to Nikki-Universal Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1977, Ser. No. 836,065

Claims priority, application Japan, Feb. 25, 1977, 52-20117

Int. Cl.² C01F *7/02*

U.S. Cl. 423—428 **5 Claims**

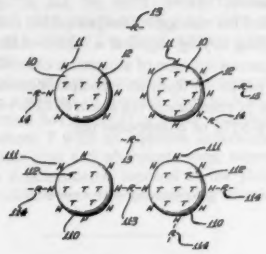
1. In a method of manufacturing substantially spherical alumina particles comprising commingling alumina hydrosol with a weak base which has a strong buffering action and is thermally decomposable at elevated temperature, dispersing the resulting mixture as droplets in a suspending medium to effect gelation thereby forming substantially spherical alumina hydrogel particles, thereafter ageing said hydrogel particles in said suspending medium, then ageing said hydrogel particles in aqueous ammonium hydroxide solution, then washing said particles in water, then drying and calcining same to obtain spherical alumina particles, the improvement which comprises:

the step of ageing said hydrogel particles in aqueous ammonium hydroxide solution is performed by contacting said particles with an aqueous ammonium hydroxide solution having an ammonia concentration in the range of from about 0.05 wt.% to about 0.5 wt.% for a first time period of at least one hour and then subjecting the thus aged particles to further ageing by contacting said particles with aqueous ammonium hydroxide solution for a second time period of at least about six hours and during said second time period continuously increasing the concentration of ammonia in said solution from an initial ammonia concentration in the range of from about 0.05 wt.% to about 0.5 wt.% up to a final ammonia concentration in the range of from about 0.8 wt.% to about 2.5 wt.%.

4,108,972
IMMUNOLOGICAL REAGENT EMPLOYING RADIOACTIVE AND OTHER TRACERS

William J. Dreyer, 2369 Highland, Altadena, Calif. 91001

Continuation-in-part of Ser. No. 451,485, Mar. 15, 1974, abandoned. This application Nov. 12, 1975, Ser. No. 631,378
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.[2] A61K *43/00;* G01N *33/16*
U.S. Cl. 424—1 21 Claims



1. A reagent for use in immuno-assay, comprising
(a) water suspendible particles selected from the group consisting of acrylamide, acrylic acid and polyacrylic acid and derivatives thereof, polymers of styrene and derivatives thereof, agar, agarose, and cellulose acetate, each particle containing a plurality of radioactive tracer atoms distributed generally throughout the volume of the particle,
(b) the particles having coupled thereto a multiplicity of molecules of a substance selected from the group consisting of antibodies, antigens and portions and equivalents thereof.

4,108,973
IMMUNOASSAY FOR CATECHOLAMINES

Richard William Avenia, Nutley, and Benjamin Pecherer, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 25, 1976, Ser. No. 717,786
Int. Cl.[2] G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 12 Claims

1. A method for assaying for individual epinephrine type catecholamines selected from epinephrine, metanephrine, synephrine and phenylephrine in a test sample which method comprises in combination:
(A) determining the total epinephrine type catecholamine concentration by conducting an immunoassay on said test sample utilizing an antibody having specificity for epinephrine type catecholamines;
(B) treating an aliquot of said test sample with iodine at pH 7.4 so as to selectively convert any epinephrine present in said test sample to a form which is not bound by said antibody, treating said aliquot with excess aqueous sulfite solution so as to reduce any remaining iodine, adjusting the pH of the resulting solution to that required for said immunoassay and then determining the epinephrine type catecholamine concentration by conducting said immunoassay on said resulting solution representing the sum total of metanephrine, synephrine and phenylephrine present in said test sample;
(C) treating a second aliquot of said test sample with iodine at pH 8.6 so as to selectively convert any epinephrine and metanephrine present in said test sample to forms which are not bound by said antibody, treating said aliquot with excess aqueous sulfite solution, adjusting the pH to a level compatible for said immunoassay and then determining the concentration of epinephrine type catecholamines by conducting said immunoassay on said test solution, said concentration representing the sum total of synephrine and phenylephrine present in said test sample; and
(D) treating a third aliquot of said test sample with iodine at pH 9.2 so as to selectively convert any epinephrine, metanephrine and synephrine present in said test sample to forms which are not bound by said antibody, treating said aliquot with excess aqueous sulfite solution, adjusting the pH to a level compatible for said immunoassay and then determining the concentration of epinephrine type catecholamine by conducting said immunoassay on said test sample, said concentration representing the phenylephrine present in said test sample;
wherein the concentration of epinephrine is determined by subtracting the concentration found in Step (B) above from that of Step (A); the concentration of metanephrine is determined by subtracting the concentration found in Step (C) above from that of Step (B); and the concentration of synephrine is determined by subtracting the concentration found in Step (D) above from that of Step (C).

4,108,974
RADIOIMMUNOASSAY FOR THYROID HORMONE

Paul F. Wegfahrt, Oakland; Nathan Lewin, Corte Madera, and James F. Monthony, Albany, all of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Aug. 27, 1976, Ser. No. 718,308
Int. Cl.[2] G01N *33/16*
U.S. Cl. 424—1 19 Claims

1. An improved radioimmunoassay for a thyroid hormone selected from the group consisting of thyroxine and triiodothyronine in an aqueous sample, which comprises contacting hydrolyzed cross-linked polyacrylamide particles, of about 0.1–10 microns in size in the unhydrolyzed form, said particles forming a substantially stable homogeneous hydrophylic suspension with said aqueous sample through the assay, said particles having bonded thereto, by covalent bonds, antibodies against the said thyroid hormone member to be determined, the aqueous sample containing said member and a corresponding thyroid hormone member labeled with a radioactive isotope to bind part of said labeled member and unlabeled member to said antibody to produce a two phase system comprising a solid phase containing said bound part of labeled member and unlabeled member and a liquid phase containing unbound labeled member and unlabeled member, separating the two phases from each other, and measuring the radioactivity of at least one of said solid and liquid phases, the value of said radioactivity being a function of the concentration of the said member in the aqueous sample.

4,108,975
RADIOIMMUNOASSAY SYSTEM

Richard Harold Hales, West Jordan, Utah, assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Mar. 4, 1977, Ser. No. 774,277
Int. Cl.[2] G01N *33/16;* A61K *43/00;* B01J *1/22*
U.S. Cl. 424—1 17 Claims

1. In a method of radioimmunoassay wherein an antigen bearing sample and a radioactive labelled antigen are brought into contact with an immobilized immunoadsorbent to form a fraction bound to the immunoadsorbent and an unbound fraction and wherein the concentration of the antigen is determined as a function of the bound or unbound fraction, or both, the improvement comprising:
flowing an antigen bearing sample and a radioactive labelled antigen into contact with an immunoadsorbent comprised of a solid particulate substrate having covalently bound thereto antibodies specific to the antigen to form a bound and unbound fraction,
said antibody including carboxyl and amine functional groups,
said substrate including a barrier coating having attached thereto functional groups selected from the group consist-

ing of acyl azide, chlorothioformate, epoxide, carbonate, thiocarbonate, isocyanate, cyanuric chloride, polyazide, polychlorothioformate, polyepoxide, polycarbonate, polythiocarbonate, polyisocyanate, polycyanuric chloride, polyimidocarbonate, polyaldehyde and polythiol,

said antibody being conjugated to said substrate by reaction between one of said carboxyl and amine groups with one of said functional groups attached to said substrate through said barrier coating,

regenerating the immunoadsorbent by releasing substantially all of the antigens bound to the immunoadsorbent by rinsing said immunoadsorbent with an eluting solvent,

detecting the labelled antigen in at least one or both of the unbound fraction and the bound fraction released by said eluting solvent, and

reusing the immunoadsorbent for further assays of further samples containing the antigen to which said antibodies are specific.

4,108,976

AUTOMATED DIRECT SERUM RADIOIMMUNOASSAY

Max G. Reese, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Mar. 4, 1977, Ser. No. 774,390

Int. Cl.[2] A61K *43/00;* **G01N** *33/16, 23/00*

U.S. Cl. 424—1 **10 Claims**

1. In a process for automated radioimmunoassay of an antigen sample by flowing the sample through a chamber containing an immobilized immunoadsorbent composed of particulate substrate having antibodies specific to the antigen covalently bound thereto, and wherein the sample contains proteins tending to plug up the particulate substrate, the improvement comprising:

diluting the sample to a consistency for free unplugged flow through the immobilized immunoadsorbent,

preincubating the sample with an antibody specific to the antigen in said sample being assayed together with a known amount of a radioactive labelled antigen to form a mixture including

(a) unlabelled antigen bound to the antibody,

(b) labelled antigen bound to the antibody,

(c) free unbound unlabelled antigen, and

(d) free unbound labelled antigen;

providing a chamber containing an immobilized immunoadsorbent including a solid particulate substrate having covalently bound thereto an antibody specific to said antigen and in an amount in excess of the sum of the free unbound labelled and unlabelled antigen,

flowing said mixture through said chamber to form two fractions, one of which is the free unbound labelled and unlabelled antigen bound to the antibody on said substrate and the second being the labelled and unlabelled antigen bound to the antibody during the preincubation step, whereby said second fraction passes through said chamber and said first fraction binds to the immobilized immunoadsorbent,

flowing an eluting solution through said chamber to effect release of said first fraction,

counting the radioactivity of at least one or both of the fractions leaving said chamber as a function of the quantity of the antigen sought to be assayed in said sample and rinsing the chamber for subsequent assays of other samples of the same antigen.

4,108,977

METHOD OF PRODUCING IMPROVED ANTIPERSPIRANT COMPOSITION

Divaker B. Kenkare, South Plainfield, and Durland K. Shumway, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,562

The portion of the term of this patent subsequent to Sep. 12, 1995 has been disclaimed.

Int. Cl.[2] A61K *7/38*

U.S. Cl. 424—46 **11 Claims**

1. A method for making an antiperspirant composition comprising co-spray drying together a liquid mixture of (a), urea, and (b)an aqueous solution of aluminum chloride and (c) aluminum chlorhydrate to form an impalpable powder containing about 1–10% of component (a), about 6–12% of component (b) and about 78–92% of component (c).

4,108,978

DENTAL COMPOSITIONS

Salvatore Mazzanobile, Haworth, and Robert John Hillermeier, Fair Lawn, both of N.J., assignors to Beecham Inc., Clifton, N.J.

Continuation of Ser. No. 461,228, Apr. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 297,500, Oct. 13, 1972, abandoned. This application Feb. 2, 1976, Ser. No. 654,198

Claims priority, application United Kingdom, Oct. 20, 1971, 48671/71

Int. Cl.[2] A61K *7/18*

U.S. Cl. 424—49 **6 Claims**

1. An oral hygiene composition in the form of a translucent dentifrice gel consisting essentially of: (a) from about 3 to about 14% of a silica xerogel of average particle size diameter of 25–30 microns; (b) from about 5.0 to about 10% of silica aerogel; (c) from about 1.0 to about 1.5% of sodium carboxymethylcellulose; (d) from about 20 to about 30% of glycerol; (e) from about 20 to about 50% of sorbitol; and (f) from about 1.05 to about 2.0% of sodium lauryl sulphate, the balance being water and agents for flavouring, sweetening and thickening said composition and providing it with anti-corrosive properties.

4,108,979

DENTIFRICE PREPARATIONS COMPRISING ALUMINUM AND A COMPATIBLE ABRASIVE

Joseph C. Muhler, Howe; Mark S. Putt, and Carl J. Kleber, both of Fort Wayne, all of Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Aug. 2, 1976, Ser. No. 710,438

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 **10 Claims**

1. A method for reducing decalcification and solubility of dental enamel and the incidence and severity of dental caries comprising the application to the teeth of a fluoride-free dentifrice preparation comprising a nontoxic and anticariogenically effective amount of at least one water-soluble aluminum salt and a dental abrasive consisting essentially of a member selected from the group consisting of purified, calcined kaolin, calcined aluminum silicate, silica, alumina, and mixtures thereof.

4,108,980

PROCESS OF PREPARING MATERIALS HAVING CALCIUM AND PHOSPHATE COMPONENTS

Edward John Duff, Sandbach, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 633,052, Nov. 18, 1975, abandoned, which is a continuation of Ser. No. 431,946, Jan. 9, 1974, abandoned. This application Mar. 4, 1977, Ser. No. 774,351

Claims priority, application United Kingdom, Jan. 11, 1973, 1633/73; Jul. 25, 1973, 35459/73; Jul. 25, 1973, 35470/73; Jul. 25, 1973, 35471/73; Jul. 30, 1973, 36095/73; Jul. 30, 1973, 36096/73; Jul. 31, 1973, 36428/73; Sep. 12, 1973, 32835/73

Int. Cl.[2] A61K *7/16, 7/18;* **A01N** *11/00*

U.S. Cl. 424—52 **4 Claims**

1. A process of supplying fluoride to teeth comprising applying to the teeth a source of fluoride ions and an orthophosphoric acid solution having a pH of about 3–4, then neutralizing the pH to about 7 with an aqueous neutralizing solution containing calcium ions and phosphate ions, wherein there is present about a stoichiometric amount of the phosphate ions relative to the calcium ions, the neutralizing solution having a pH of about 7.

4,108,981

ALKALINE ORAL COMPOSITIONS COMPRISING ALUMINUM AND A CARBOXYLIC ACID

Joseph C. Muhler, Howe; Mark S. Putt, and Carl J. Kleber, both of Fort Wayne, all of Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Aug. 2, 1976, Ser. No. 710,439

Int. Cl.[2] A61K *7/24*

U.S. Cl. 424—55 **10 Claims**

1. A method for reducing the incidence and severity of dental caries comprising the application to the teeth of a preparation comprising:

an anticariogenically effective and non-toxic amount of at least one water-soluble aluminum salt;

a non-toxic amount of a member selected from the group consisting of stable carboxylic acids and water-soluble salts thereof; and

a carrier suitable for use in the oral cavity,

the pH of said composition lying in the range of about 7.0–9.0, and

the molar ratio of complexing carboxylic acid or salt thereof to aluminum ion being at least about 1.1.

4,108,982

4-(2-IMIDAZOLIN-2-YL) AMINOPYRAZOLES

Herman Amschler, Radolfzell, Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Germany

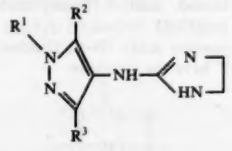
Filed Oct. 19, 1976, Ser. No. 733,866

Claims priority, application Luxembourg, Oct. 20, 1975, 73608

Int. Cl.[2] C07D *403/12;* **A61K** *7/15*

U.S. Cl. 424—73 **11 Claims**

1. A physiologically-active and pharmaceutically-acceptable 4-(2-imidazolin-2-yl)aminopyrazole of the formula



wherein each of R^1, R^2 and R^3 is, independently a hydrogen atom (—H), alkyl having up to 7 carbon atoms, alicyclic hydrocarbyl having from 3 to 7 ring carbon atoms and optionally lower-alkyl substituted, phenyl, substituted phenyl, phenylalkyl or nuclearly-substituted phenylalkyl; the alkyl of phenylalkyl and of substituted phenylalkyl having from 1 to 4 carbon atoms and any substituent of substituted phenyl or of substituted phenylalkyl being a member selected from the group consisting of halo, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, trifluoromethyl and nitro;

or a pharmacologically-acceptable acid-addition salt thereof.

11. A process for strengthening hair or making it more erect which comprises applying thereto an effective amount of a product according to claim 1.

4,108,983

VIRAL ONCOLYSATE VACCINE FOR STIMULATING THE IMMUNE MECHANISM OF MAMMALS TO SPECIES-SPECIFIC TUMORS

Marc K. Wallack, Cherry Hill, N.J., assignor to The Wistar Institute, Philadelphia, Pa.

Filed Jun. 1, 1976, Ser. No. 691,486

Int. Cl.[2] A61K *39/12;* **C12K** *9/00*

U.S. Cl. 424—89 **17 Claims**

1. A method of forming a vaccine capable of stimulating the immune mechanism of mammals to species-specific tumors comprising infecting cells of a species-specific tumor in vitro with a virus having a lytic action on the cells of said tumor, said virus comprising vaccinia virus and being substantially less pathogenic for said mammal than is said tumor, maintaining said virus infected cells under culture conditions until a viral oncolysate is formed and harvesting said oncolysate.

4,108,984

COMPOSITIONS AND METHODS FOR THE TREATMENT OF ATHLETE'S FOOT

Masataro Sato, No. 28-26 Fukuokamachi 2-chome, Takamasatu, Japan

Filed Jan. 14, 1977, Ser. No. 759,492

Int. Cl.[2] A61K *37/48*

U.S. Cl. 424—94 **4 Claims**

1. A method for treating wet athlete's foot on a patient in need of said therapy comprising applying a dry mixture of (1) montmorillonite in finely powdered form with (2) pyroligneous acid in a weight ratio of 4 to 1 and (3) a very small quantity of papain enzyme to the affected area in an amount sufficient to keep the affected area dry and to ameliorate the wet athlete's foot.

4. A composition for the treatment of dermatomycosis pedis comprising a dry mixture of finely powdered montmorillonite and pyroligneous acid in a weight ratio of about 4 to 1, a small quantity of papain enzyme present in an amount of about 1/5000 by weight of the mixture, and further including about 0.5% of lysozyme hydrochloride.

4,108,985

DIHYDROCYCLOSPORIN C

Artur Rüegger, Bottmingen, and Max Kuhn, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

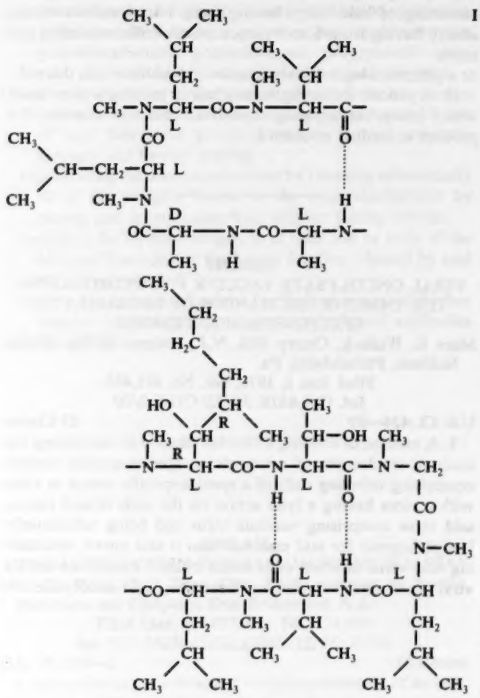
Filed Oct. 27, 1976, Ser. No. 736,106

Claims priority, application Switzerland, Nov. 4, 1975, 14195/75

Int. Cl.[2] A61K *31/16;* **C07D** *259/00*

U.S. Cl. 424—177 **9 Claims**

1. Dihydrocyclosporin C of formula



5. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 in association with a pharmaceutical carrier or diluent.

4,108,986

N^2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuno Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

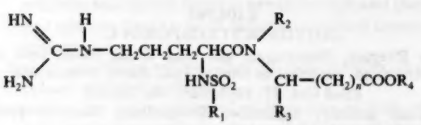
Continuation-in-part of Ser. No. 656,870, Feb. 10, 1976, which is a continuation-in-part of Ser. No. 671,436, Mar. 29, 1976, and a continuation-in-part of Ser. No. 671,568, Mar. 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,654

Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635

Int. Cl.[2] **A61K** *37/02;* **C07C** *103/52*

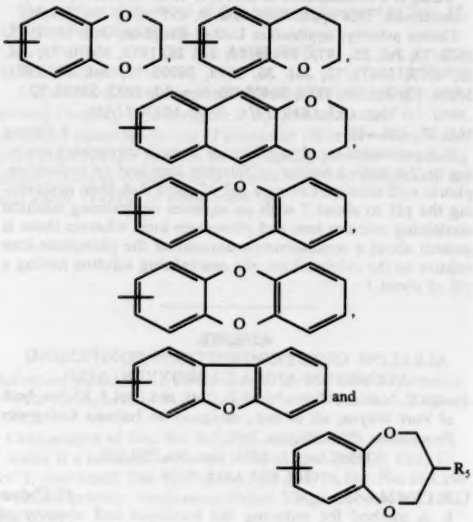
U.S. Cl. 424—177 **9 Claims**

1. N^2-arylsulfonyl-L-argininamides having the formula (I):



(I)

and the pharmaceutically acceptable salts thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl, naphthyl subsituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl and C_1–C_{10} alkoxy, phenyl, phenyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy and C_2–C_{20} dialkylamino, C_7–C_{12} aralkyl,



wherein R_5 is hydrogen, C_1–C_{10} alkyl or C_1–C_{10} alkoxy; R_2 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_8–C_{15} α -carboxyaralkyl, C_3–C_{10} cycloalkyl and C_4–C_{10} cycloalkylalkyl; R_3 is selected from the group consisting of C_1–C_5 alkyl, carboxy, C_2–C_{10} alkoxycarbonyl, phenyl, C_7–C_{12} aralkyl and ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_4 is selected from the group consisting of C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl and 5-indanyl; and n is an integer or 0, 1 or 2.

4,108,987

CYCLIC HEXAPEPTIDES

Daniel F. Veber, Ambler; Stephen F. Brady, Philadelphia, and Sandor L. Varga, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 710,491, Aug. 2, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,501

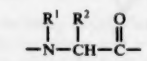
Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **11 Claims**

1. The peptides having the structure:

cyclo[(N-alkylamino acid)-X-(N-alkylamino acid)'-X-(N-alkylamino acid)''-X]

wherein (N-alkylamino acid), (N-alkylamino acid)' and (N-alkylamino acid)'' have the structure:



wherein R^1 is a lower alkyl group having 1 to 3 carbon atoms and R^2 is hydrogen and methyl or R^1 and R^2 are $—CH_2—_n$ n being an integer 2 or 3, and form a 4- or 5-membered ring; and X is D- or L-Ala, D- or L-Phe, D- or L-Leu, D- or L-p-halophenylalanyl or D- or L-p-nitrophenylalanyl, with the proviso that when R^1 is methyl and R^2 is hydrogen, X is not D-Ala.

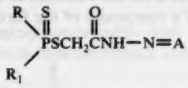
4,108,988

INSECTICIDAL HYDRAZONE PHOSPHATES AND PHOSPHONATES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

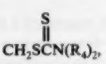
Filed Jul. 5, 1977, Ser. No. 812,956
Int. Cl.[2] A01N 9/36; C07F 9/165
U.S. Cl. 424—211 26 Claims

1. A method of combatting insects comprising applying to the insect or the habitat thereof an insecticidally effective amount of a compound having the formula

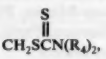


in which R is lower alkyl or lower alkoxy; R_1 is lower alkoxy; A is cycloalkyl, lower alkyl-substituted cycloalkenyl or

R_2 is alkyl, aryl, aralkyl, cycloalkyl, hydrogen or

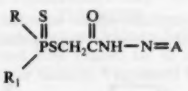


R_3 is aryl, aralkyl, cycloalkyl or



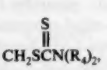
and R_4 is lower alkyl.

3. A compound having the formula

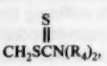


in which R is lower alkyl or lower alkoxy; R_1 is lower alkoxy; A is cycloalkyl, lower alkyl-substituted cycloalkenyl or

R_2 is alkyl, aryl, aralkyl, cycloalkyl, hydrogen or



R_3 is aryl, aralkyl, cycloalkyl or



and R_4 is lower alkyl.

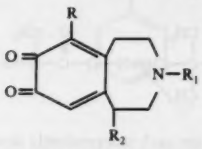
4,108,989

2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINE-7,8-DIONES

Kenneth George Holden, Haddonfield, N.J., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed Apr. 1, 1977, Ser. No. 783,574
Int. Cl.[2] A61K 31/55; C07D 223/16
U.S. Cl. 424—244 6 Claims

1. A compound of the formula:



in which:

R is hydrogen or halo;

R_1 is lower alkyl having from 1 to 5 carbon atoms, lower alkanoyl having from 1 to 5 carbon atoms, benzyl, phenethyl, carbobenzyloxy, or hydroxyethyl; and

R_2 is phenyl, or phenyl which is optionally substituted with a lower alkyl having from 1 to 5 carbon atoms, halo, lower alkoxy having from 1 to 4 carbon atoms, hydroxy or thiomethyl;

and the pharmaceutically acceptable nontoxic salts thereof.

6. The method of producing dopaminergic activity in an animal in need of such activity which comprises administering internally a nontoxic sufficient amount of the compound of claim 1.

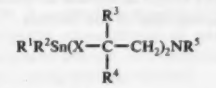
4,108,990

METHOD OF KILLING BACTERIA AND FUNGI

Hans Plum, Heessen; Max Buschhoff, Luenen, and Alena Cejka, Dortmund, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jun. 11, 1976, Ser. No. 695,125
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1975, 2526711; Mar. 16, 1976, 2610931
Int. Cl.[2] A01N 9/12
U.S. Cl. 424—245 14 Claims

1. The method of killing bacteria and fungi which comprises bringing them into contact with a pesticidally-effective amount of a diorgano tin compound of the formula



wherein R^1 and R^2 are alkyl having 1–10 carbon atoms, alkenyl having 1–10 carbon atoms, cycloalkyl, or aromatic; R^3 and R^4, taken alone, are the same or different and are hydrogen, alkyl having 1–10 carbon atoms or alkenyl having 1–10 carbon atoms; R^3 and R^4, taken together, are doubly bound oxygen; R^5 is hydrogen, alkyl having 1 to 10 carbon atoms, alkenyl having 1 to 10 carbon atoms, cycloalkyl, or a member selected from the group consisting of phenyl, naphthyl, m-tolyl, p-tolyl, m-methoxyphenyl, p-methoxyphenyl, benzyl, and 5-acetamido-2-ethoxy phenyl; and X is oxygen or sulfur.

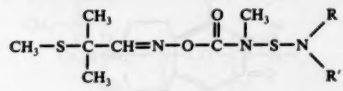
4,108,991

N-AMINOSULFENYL DERIVATIVES OF ALDICARB

Tetsuo Roy Fukuto, Riverside, Calif., and Allan Lindsay Black, Balmain, Australia, assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 6, 1976, Ser. No. 747,752
Int. Cl.[2] C07C *131/00;* A01N *9/12*
U.S. Cl. 424—248.5 10 Claims

1. A compound of the formula



wherein R and R′ are each independently straight or branched chain alkyl of 1 to 6 carbon atoms, phenyl or phenylalkyl wherein the alkyl portion is straight or branched chain of 1 to 3 carbon atoms, or R and R′ taken together with the nitrogen form a piperidine, morpholine, pyrollidine, piperazine or hexahydroazepine ring.

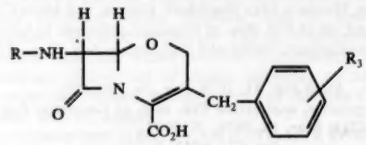
4,108,992

CEPHALOSPORIN ANALOGUES AND COMPOSITIONS

Michael John Pearson, Roffey, and Clive Leslie Branch, South Holmwood, both of England, assignors to Beecham Group Limited, Great Britain

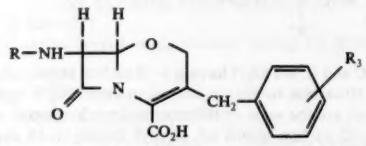
Division of Ser. No. 684,078, May 7, 1976. This application Feb. 7, 1977, Ser. No. 766,213
Claims priority, application United Kingdom, May 10, 1975, 19744/75
Int. Cl.[2] A01N *9/00, 9/22;* C07D *265/00, 273/00*
U.S. Cl. 424—248.53 12 Claims

1. A compound of the formula



wherein R is D-α-hydroxy-benzylcarbonyl and R_3 is hydrogen, carboxylic acid, carboxamido or an esterified carboxylic acid of 1–10 carbons in the ester portion.

5. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially effective amount of a compound of the formula



or a pharmaceutically acceptable salt thereof wherein R is D-α-hydroxy-benzylcarbonyl and R_3 is hydrogen, carboxylic acid, carboxamido or an esterified carboxylic acid of 1–10 carbons in the ester portion, in combination with a pharmaceutically acceptable carrier.

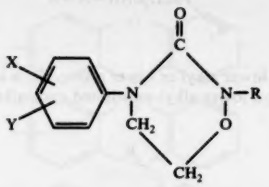
4,108,993

3-OXO-5,6-DIHYDRO-1,2,4-OXADIAZINES USEFUL AS ANTIANDROGENIC AGENTS

Claude Bonne, Bry-sur-Marne; Jacques Perronnet, Paris, and André Teche, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

Filed Oct. 5, 1976, Ser. No. 729,763
Claims priority, application France, Oct. 15, 1975, 75 31566
Int. Cl.[2] A01N *9/00, 9/22*
U.S. Cl. 424—248.57 4 Claims

1. A method of treating symptoms of hyperandrogenicity in warm-blooded animals comprising topically applying to the skin or mucous of warm blooded animals an antiandrogenically effective amount of a compound of the formula



wherein X and Y are individually selected from the group consisting of hydrogen, halogen, $—CF_3$, $—NO_3$ and alkylthio of 1 to 4 carbon atoms and R is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, benzyl and hydroxymethyl.

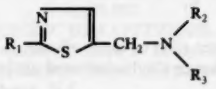
4,108,994

5-THIAZOLE-METHANE-AMINES, AND THEIR USE AS ANTILIPOLYTICS

André Poittevin, Vaires-sur-Marne; Pierre Henri Derible, Le Perreux, and Robert Fournex, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Filed Sep. 8, 1976, Ser. No. 721,370
Claims priority, application France, Sep. 12, 1975, 75 28095; Mar. 31, 1976, 76 09337
Int. Cl.[2] C07D *277/38;* A61K *31/425*
U.S. Cl. 424—250 14 Claims

1. A 5-thiazole-methane-amine selected from the group consisting of (1) compounds having the formula



wherein R_1 represents an alkyl having from 1 to 6 carbon atoms and R_2 and R_3 represent members selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms, hydroxyalkyl having 1 to 6 carbon atoms, and taken together with the nitrogen atom form a member selected from the group consisting of pyrrolidin-1-yl, imidazolidin-1-yl, 3-methyl-imidazolidin-1-yl, 3-ethyl-imidazolidin-1-yl, pyrazolidin-1-yl, 2-methyl-pyrazolidin-1-yl, piperidin-1-yl, piperazin-1-yl, 4-methyl-piperazin-1-yl, 4-ethyl-piperazin-1-yl, 4-propyl-piperazin-1-yl, 4-butyl-piperazin-1-yl, hexahydropyridazin-1-yl, 2-methyl-hexahydro-pyridazin-1-yl, hexahydropyrimidin-1-yl and 3-methyl-hexahydro-pyrimidin-1-yl and (2) its acid addition salts with non-toxic, pharmaceutically-acceptable acids.

12. A method for the treatment of hyperlipemia and diabetis in warm-blooded animals suffering from the same comprising administrating to said warm-blooded animals an amount to lower the level of plasmatic free fatty acids in the blood and hypoglycemically effective amount of at least one compound of claim 1.

4,108,995
HYDROXYHEXYL-ALKYLXANTHINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING HYDROXYHEXYL-ALKYLXANTHINES

Werner Mohler, Hofheim; Manfred Jayme, Rüsselsheim; Heinz-Joachim Hinze, Wiesbaden; Jaromir Komarek, Wiesbaden; Mario Reiser, Wiesbaden, and Alfons Söder, Frankfurt-Schwanheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

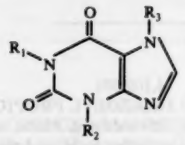
Filed Jul. 5, 1974, Ser. No. 485,869

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1973, 2335170

Int. Cl.[2] A61K *31/52*; C07D *473/06*

U.S. Cl. 424—253 **21 Claims**

1. A physiologically-acceptable and pharmacologically-active cerebral-blood-flow-improving compound of the formula



(I)

wherein

one of R_1, R_2 and R_3 is 4-, 5- or 6- hydroxyhexyl;

one of R_1, R_2 and R_3 is alkyl having from 2 to 12 carbon atoms; and

one of R_1, R_2 and R_3 is a hydrogen atom (-H) or alkyl having from 1 to 12 carbon atoms; and

R_2 being alkyl or hydroxyhexyl; or a physiologically-acceptable acid-addition salt of such compound.

4,108,996
(−)-APOVINCAMINOL LAURIC ACID ESTER AND CEREBRAL VASODILATORY COMPOSITION THEREOF

Csaba Lörincz; Maria Bolyos; Kálman Szisz; Laszlo Szporny; Egon Karpati, and Eva Palosi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jul. 7, 1976, Ser. No. 703,207

Claims priority, application Hungary, Jul. 18, 1975, RI 573

Int. Cl.[2] A61K *31/445*; C07D *519/04*

U.S. Cl. 424—256 **2 Claims**

1. (−) -apovincaminol lauric acid ester or a pharmaceutically acceptable salt thereof.

4,108,997
DIURETIC [2]BENZOPYRANO[4,3-B]PYRIDINES AND PROCESS THEREFOR

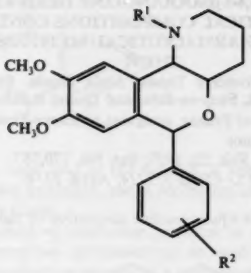
Jean A. Gauthier, Montreal; Leslie G. Humber, Dollard des Ormeaux, and Clara Revesz, Montreal, all of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Filed Dec. 20, 1976, Ser. No. 752,655

Int. Cl.[2] A61K *31/445*; C07D *491/04*

U.S. Cl. 424—256 **10 Claims**

1. A compound of formula I



(I)

in which R^1 is lower alkyl or lower cycloalkyl(lower)alkyl and R^2 is hydrogen or halo, or a therapeutically acceptable acid addition salt thereof.

8. A method for increasing the excretion of urine in a mammal which comprises administering to said mammal an effective diuretic amount of a compound of claim **1**, or a therapeutically acceptable salt thereof.

4,108,998
FURO[3,4-B]QUINOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING THEM

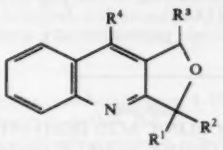
Christopher A. Demerson, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corp., New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,779

Int. Cl.[2] A61K *31/47*; C07D *491/14*

U.S. Cl. 424—258 **22 Claims**

1. A compound of formula I



(I)

in which R^1 is lower alkyl; R^2 is lower alkyl; R^3 is hydrogen or a radical of formula $(CH_2)_nNR^7R^8$ wherein n is an integer from 1 to 6 and R^7 and R^8 each is lower alkyl; and R^4 is hydrogen, chloro, bromo or a radical of formula Y-X wherein Y is O or NH and X is 2,2,6,6-tetramethyl-4-piperidinyl or a radical of formula Z-R^9 wherein Z is lower alkylene or hydroxy (lower) alkylene and R^9 is phenyl, 1-pyrrolidinyl, 2-oxo-1-pyrrolidinyl, 3-pyridyl or a radical of formula $NR^{10}R^{11}$ wherein R^{10} and R^{11} each is hydrogen, lower alkyl or hydroxy (lower) alkyl, or a therapeutically acceptable salt thereof.

19. A method for treating hypertension in a mammal which comprises administering to said mammal an effective antihypertensive amount of a compound of claim **1**, or a therapeutically acceptable salt thereof.

20. A method for treating microbial infections in a mammal which comprises administering to said mammal an effective antimicrobial amount of a compound of claim **1**, or a therapeutically acceptable salt thereof.

21. An antihypertensive composition comprising an effective amount of a compound of claim **1**, or a therapeutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

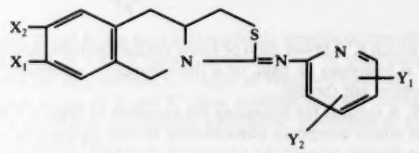
22. An antimicrobial composition comprising an effective amount of a compounds of claim **1**, or a therapeutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,108,999
THIAZOLO[3,4-b]ISOQUINOLINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND PHARMACEUTICAL METHODS USING THEM

Daniel Farge, Sylvestres Thiais; Alain Jossin, Saint Cloud; Gérard Ponsinet, Sucy-en-Brie, and Daniel Reisdorf, Republique-Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Feb. 22, 1977, Ser. No. 770,757
Int. Cl.[2] C07D *513/14;* A61K *31/47*
U.S. Cl. 424—258 **9 Claims**

1. A thiazolo[3,4-b]isoquinoline derivative of the formula:



wherein X_1 represents hydrogen, halogen, methoxy or cyano, X_2 represents hydrogen, halogen or methoxy, or X_1 and X_2 together represent methylenedioxy, and Y_1 and Y_2 each represent hydrogen, halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, alkylthio of 1 through 4 carbon atoms, hydroxy, or diacetylamino, and its non-toxic pharmaceutically acceptable acid addition salts.

8. A pharmaceutical composition for the treatment of medicinal and other gastritis and gastralgias and the treatment of ulcers which comprises an effective amount of a thiazolo[3,4-b]isoquinoline derivative as claimed in claim **1**, or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a pharmaceutically acceptable carrier.

9. A method for the treatment of medicinal and other gastritis and gastralgias and the treatment of ulcers in a patient which comprises administering to the patient an effective amount of a thiazolo[3,4-b]isoquinoline derivative as claimed in claim **1** or a non-toxic pharmaceutically acceptable acid addition salt thereof.

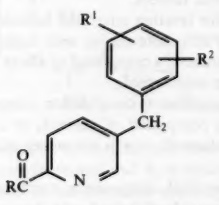
4,109,000
5-BENZYLPICOLINIC ACID DERIVATIVES

Osamu Tanabe; Akiro Obayashi, both of Uji; Teruya Nakamura, Muko; Osamu Suzuka; Masao Murayama, both of Kyoto, and Hiromu Murai, Otsu, all of Japan, assignors to Nippon Shinyaku Co., Ltd. and Takara Shuzo Co., Ltd., both of, Japan

Continuation-in-part of Ser. No. 648,626, Jan. 13, 1976, abandoned, and Ser. No. 607,039, Aug. 22, 1975, Pat. No. 4,009,077, which is a continuation-in-part of Ser. No. 582,766, Jun. 2, 1975, abandoned. This application Jun. 16, 1976, Ser. No. 696,549

Claims priority, application Japan, Jan. 22, 1975, 50-9998; Jan. 22, 1975, 50-9999; Jan. 22, 1975, 50-10000; Jan. 22, 1975, 50-10001; Jan. 22, 1975, 50-10002; Jan. 22, 1975, 50-10003
Int. Cl.[2] A61K *31/44;* C07D *213/69*
U.S. Cl. 424—263 **26 Claims**

1. A compound of the formula:



wherein

R is hydroxy, lower alkoxy or

in which each of R^4 and R^5, independently of the other, is hydrogen, lower alkyl, benzyl, phenethyl or phenyl; and

each of R^1 and R^2, independently of the other, is hydrogen, lower alkyl, halo, lower alkoxy, nitro, amino, acetamido, hydroxy or acetoxy,

and the pharmaceutically acceptable salts thereof.

25. The method of effecting a hypotensive response in humans and other animals which comprises administering thereto a compound according to claim **1**.

4,109,001
ARYL-SUBSTITUTED TRIAZOLYL PROPIONIC ACIDS

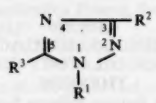
Robert Thomas Buckler, Edwardsburg, Mich., and Elva Kurchacova, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 763,504, Jan. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 706,065, Jul. 16, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,523
Int. Cl.[2] C07D *249/08;* A61K *31/41*
U.S. Cl. 424—269 **12 Claims**

1. 3-[3-phenyl-1,2,4,(1H)-triazol-5-yl]propionic acid monohydrate, and pharmacologically acceptable, non-toxic salts thereof.

11. A therapeutic method for treating algia in an individual for whom such therapy is indicated, comprising:

administering to the individual an effective analgesic amount of a compound of the formula



and pharmacologically acceptable, non-toxic salts thereof wherein:

R^1, R^2 and R^3 are always dissimilar;

R^1 is selected from the group consisting of monochlorophenyl and di-chlorophenyl;

R^2 is 2-carboxyethyl; and

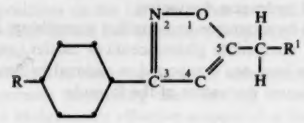
R^3 is hydrogen.

4,109,002
FUNGICIDAL 3-PHENYL-5-(SUBSTITUTED METHYL) ISOXAXOLES

James D. Davenport; Barry A. Dreikorn, both of Indianapolis, Ind., and A. Frederick Elsasser, Columbus, Ohio, assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 14, 1976, Ser. No. 695,669
Int. Cl.[2] A01N *9/22, 9/28*
U.S. Cl. 424—272 **7 Claims**

1. A fungicidal method of reducing the adverse effects of fungal foliar phytopathogens which comprises applying to the phytopathogens on the foliage of host plants an effective phytopathogen-inhibiting amount of a compound of the formula



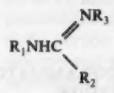
wherein
R represents
chloro,
bromo,
fluoro,
trifluoromethyl, or
hydrogen;
R^1 represents
isothiocyanato.

4,109,003
PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 551,220, Feb. 19, 1975, Pat. No. 4,036,971. This application May 5, 1977, Ser. No. 794,179
Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74
Int. Cl.[2] A61K *31/415;* **C07D** *233/64*
U.S. Cl. 424—273 R **7 Claims**

1. A compound of the formula:



wherein R_1 represents a grouping of the structure

$$Het - CH_2 - S - (CH_2)_n -$$

wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; *n* is 2 or 3; R_2 is SR_4; R_3 is hydrogen, lower alkyl or R_1; and R_4 is lower alkyl, or a pharmaceutically acceptable addition salt thereof.

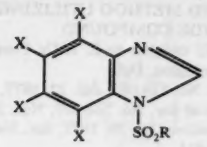
7. A method of blocking histamine H_2-receptors, said histamine H_2-receptors being those histamine receptors which are not blocked by mepyramine but are blocked by burimamide, which comprises administering to an animal in need of blocking of said histamine H_2-receptors in an effective amount to block said histamine H_2-receptors a compound of claim **1**.

4,109,004
HALOGENATED ALKYLSULPHONYL-BENZIMIDAZOLES

Albert Percival, Hauxton, England, assignor to Fisons Limited, England

Filed Aug. 22, 1977, Ser. No. 826,817
Claims priority, application United Kingdom, Aug. 25, 1976, 35306/76
Int. Cl.[2] C07D *235/22;* **A61K** *31/415*
U.S. Cl. 424—273 R **11 Claims**

1. A substituted benzimidazole of the formula:


(I)

wherein at least two of the radicals X are halogen and the remainder are hydrogen, and R represents an alkyl radical of 1 to 6 carbon atoms.

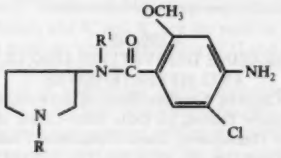
8. A method of combating protozoa in an animal, which method comprises administering to said animal an anti-protozoally effective amount of a compound claimed in claim **1**.

4,109,005
METHOD OF INCREASING RATE OF GASTRIC EMPTYING WITH PYRROLIDINYLBENZAMIDES

Carl D. Lunsford, and Reevis S. Alphin, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed May 11, 1977, Ser. No. 795,827
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **5 Claims**

1. The method of increasing the rate of gastric emptying in mammalian subjects which comprises administering orally or parenterally thereto an effective amount of compounds selected from those having the formula:



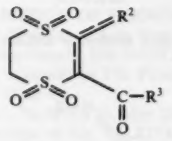
wherein;
R is methyl or cyclohexyl having 3–12 carbon atoms,
R^1 is hydrogen or methyl, and
the pharmaceutically acceptable salts thereof.

4,109,006
1,4-DITHIINOXIDES

Richard C. Johnson, Ambler, and Peter L. deBenneville, Philadelphia, both of Pa., assignors to Warren-Teed Laboratories, Inc., Columbus, Ohio

Filed Oct. 12, 1976, Ser. No. 731,154
Int. Cl.[2] A61K *31/385;* **C07D** *339/00, 339/02, 339/08*
U.S. Cl. 424—277 **12 Claims**

1. A pharmaceutical composition useful in treating gastric ulcers which comprises an effective amount of a compound of the formula:



wherein R^2 is hydrogen, lower alkyl or cyano and R^3 is lower alkoxy, lower alkylamino or di-lower alkylamino in a pharmaceutically acceptable carrier.

4,109,007

MITICIDAL MIXTURES AND METHOD UTILIZING A MACROTETROLIDE COMPOUND

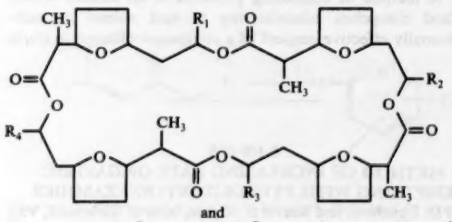
Silas S Sharp, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 818,082, Jul. 22, 1977, abandoned, which is a division of Ser. No. 746,107, Nov. 30, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,411

Int. Cl.[2] **A01N** *9/02, 9/20, 9/28*

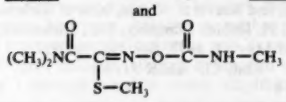
U.S. Cl. 424—279 **3 Claims**

1. A miticidally effective mixture consisting essentially of



(I)

and



(III)

wherein

R_1, R_2, R_3 and R_4 are each selected from the group consisting of methyl and ethyl and

the ratio of III to I is from 4:1 to 16:1.

4,109,008

HYDRAZINE DERIVATIVES USEFUL AS ANTI-HYPERTENSIVES

Jean-Calude Cognacq, Garches; Bernard Schweisguth, Meudon, and Jean-Marie Teulon, La Celle Saint-Cloud, all of France, assignors to Hexachimie, Rueil-Malmaison, France

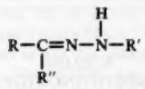
Filed Dec. 29, 1976, Ser. No. 755,194

Claims priority, application United Kingdom, Jan. 7, 1976, 562/76

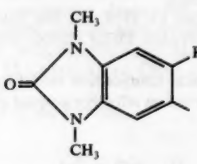
Int. Cl.[2] **C07D** *235/26, 403/12;* **A61K** *31/415*

U.S. Cl. 424—273 R **8 Claims**

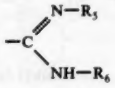
1. A hydrazine derivative of the formula:



in which R is the radical of formula:



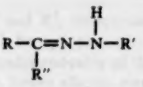
wherein R_3 is hydrogen, methyl or methoxy, R′ is a radical of formula:



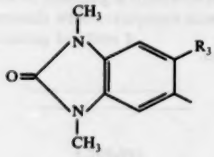
in which R_5 and R_6 are each hydrogen and R″ is hydrogen and the pharmaceutically acceptable addition salts with non-toxic acids of said hydrazine derivative.

5. An anti-hypertensive composition comprising, in association with a compatible pharmaceutical carrier, an effective amount of at least one compound as claimed in claim 1.

7. A hydrazine derivative of the formula:

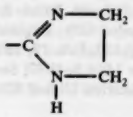


in which R is the radical of formula:



wherein R_3 is hydrogen, methyl or methoxy,

R′ is an imidazolinyl radical of formula:



R″ is hydrogen, and the pharmaceutically acceptable addition salts with non-toxic acids of said hydrazine derivative.

4,109,009

ANALGESIC, RELAXANT, AND ANTI-INFLAMMATORY CYCLOPENTANOL DERIVATIVES

Jean Buendia, Nogent-sur-Marne, and Jeanine Schalbar, Suresnes, both of France, assignors to Roussel Uclaf, Paris, France

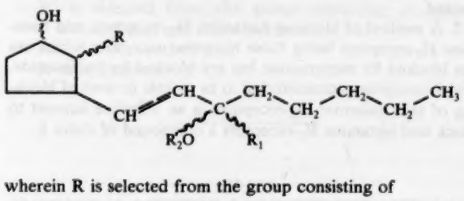
Filed Aug. 24, 1976, Ser. No. 717,048

Claims priority, application France, Aug. 29, 1975, 75 26616

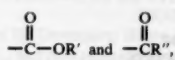
Int. Cl.[2] **A61K** *31/045, 31/35;* **C07D** *309/22, 309/06*

U.S. Cl. 424—283 **19 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of



R′ is selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms and a non-toxic, pharmaceutically acceptable cation, R″ is alkyl of 1 to 6 carbon atoms, R_1 is selected from the group consisting of hydrogen and straight or branched chain, saturated and unsaturated alkyl of 1 to 4 carbon atoms and R_2 is selected from the group consisting of hydrogen and tetrahydropyranyl, the wavy lines connecting R and —OH to the cyclopentane ring and —OR_2 and R_1 to the

chain indicates that the substituents may be in either of the possible positions on the carbon atoms to which they are attached and the dotted line indicates the optional presence of a double bond.

13. A method of relieving pain and inflammation in warm-blooded animals comprising administering to warm-blooded animals an analgesically effective amount of at least one compound of claim 1.

17. A method of relaxing smooth muscles in warm-blooded animals comprising administering to warm-blooded animals a smooth muscle relaxant effective amount of at least one compound of claim 1.

4,109,010
ANTI-MICROBIAL COMPOSITIONS

Roy C. Sias, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 15, 1974, Ser. No. 442,948
Int. Cl.[2] A01N *9/00*
U.S. Cl. 424—289 **2 Claims**

1. An anti-microbial formulation containing from about 0.5 to about 50 weight percent of an ammoniated zinc compound selected from the group consisting of

a. ammoniated zinc salts of alkylaryl sulfonic acids wherein the alkyl portion contains from 1 to 16 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc;

b. ammoniated zinc salts of benzene sulfonic acid containing an average of 0.5 to 6.0 molecules of ammonia per molecule of zinc;

c. ammoniated zinc salts of alkyl hydroxy sulfonic acids wherein the alkyl portion contains from 12 to 20 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc;

d. ammoniated zinc salts of olefin sulfonic acids wherein said olefin portion contains from 12 to 20 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc;

e. ammoniated zinc salts of alkyl sulfates wherein said alkyl portion contains from 10 to 16 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc;

f. ammoniated zinc salts of diphenylalkane sulfonic acids wherein the alkyl portion contains a total of from 2 to about 16 carbon atoms and wherein said salts contain an average of from 0.5 to 6.0 molecules of ammonia per molecule of zinc; and

g. combinations thereof;

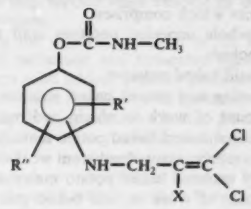
from about 98.5 to about 20 weight percent water; and from about 1 to about 30 weight percent of an alcohol selected from the group consisting of alkanols containing from about 2 to about 4 carbon atoms, and dihydroxyalkanols containing from about 2 to about 4 carbon atoms.

4,109,011
INSECTICIDE CARBAMATES OF N-(POLYCHLOROALLYL)-AMINO-PHENOLS

Paolo Piccardi, Milan; Paride Paolucci; Franco Gozzo, both of S. Donato Milanese (Milan); Angelo Longoni, Milan; Vincenzo Dongiovanni, Milan, and Giovanni Renis, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

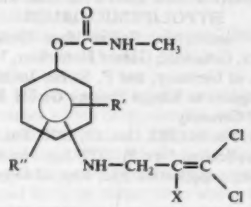
Continuation-in-part of Ser. No. 680,921, Apr. 28, 1976, abandoned. This application Apr. 27, 1977, Ser. No. 791,332
Claims priority, application Italy, May 2, 1975, 22949 A/75
Int. Cl.[2] A01N *9/12, 9/20;* **C07C** *125/06*
U.S. Cl. 424—300 **7 Claims**

1. An insecticidal agent, said agent being a compound having the general formula:



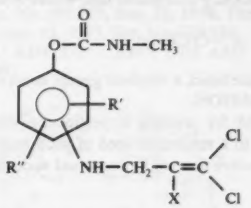
where X is selected from the group consisting of H, Cl and S-R‴ where R‴ is selected from the group consisting of lower alkyl and phenyl; and R′ and R″ are the same or different and are selected from the group consisting of H and C_1–C_4 alkyls.

2. An insecticidal composition comprising, in admixture, an insecticidally effective amount of an insecticidal agent having the general formula:



where X is selected from the group consisting of H, Cl and S-R‴ where R‴ is selected from the group consisting of lower alkyl and phenyl; and R′ and R″ are the same or different and are selected from the group consisting of H and C_1–C_4 alkyls, and an inert carrier therefor.

7. A method of combatting insect infestations for longer periods of time in the field comprising spraying said insect or its food, habitat or environment with an insecticidally effective amount of an insecticidal agent having the general formula:



where X is selected from the group consisting of H, Cl and S-R‴ where R‴ is selected from the group consisting of lower alkyl and phenyl; and R′ and R″ are the same or different and are selected from the group consisting of H and C_1–C_4 alkyls, said compound having a longer persistence in the field.

4,109,012
PREPARATION OF FRENCH FRIES

Paul Edward Bates, Woodlawn; John Ronald Hughes, Colerain Township, Hamilton County, and Nahid Zoueshtiagh, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 578,970, May 19, 1975, abandoned, which is a continuation of Ser. No. 428,513, Dec. 26, 1973, abandoned. This application Feb. 19, 1976, Ser. No. 659,437
Int. Cl.[2] A23L *1/00*
U.S. Cl. 426—302 **12 Claims**

1. A process for the preparation of a mealy textured work-

able coherent potato dough adapted to the formation of french fry potato pieces which comprises:

(a) baking whole unpeeled potatoes until they are completely cooked;

(b) peeling said baked potatoes;

(c) comminuting said peeled baked potatoes using a minimum amount of work to obtain and maintain a mealy textured comminuted baked potato material; and

(d) forming a mealy textured coherent workable dough from said mealy textured baked potato material using a minimum amount of work on said baked potato material to avoid a large amount of breakup of individual potato cells and a corresponding increase in free starch.

4,109,013
SUBSTITUTED PROPANOL-(2) DERIVATIVES OF HYDROXAMIC ACIDS AND THE USE THEREOF AS HYPOLIPEMIC DRUGS

Helmut Grill, Vaterstetten; Rainer Hans Zschocke, Munich; Josef Wagner, Grünwald; Gernot Hofrichter, Vaterstetten, all of Fed. Rep. of Germany, and P. Stefan Janiak, Basel, Switzerland, assignors to Klinge Pharma GmbH & Co., Munich, Fed. Rep. of Germany

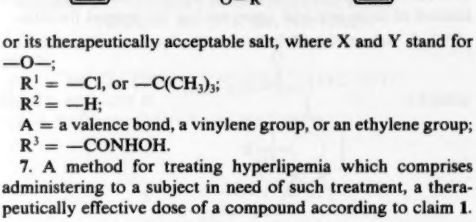
Division of Ser. No. 641,982, Dec. 18, 1975, Pat. No. 4,073,935. This application Nov. 9, 1977, Ser. No. 849,766

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1974, 2460689

Int. Cl.[2] A61K *31/185;* **C07C** *83/10*

U.S. Cl. 424—315 **7 Claims**

1. A 1,3-disubstituted propanol-(2) derivative of the general formula



or its therapeutically acceptable salt, where X and Y stand for —O—;

R^1 = —Cl, or $—C(CH_3)_3$;

R^2 = —H;

A = a valence bond, a vinylene group, or an ethylene group;

R^3 = —CONHOH.

7. A method for treating hyperlipemia which comprises administering to a subject in need of such treatment, a therapeutically effective dose of a compound according to claim 1.

4,109,014
PHARMACEUTICAL, COMPOSITIONS CONTAINING SUBSTITUTED 4'-HYDROXYPHENYL GUANIDINES AND METHODS OF USING SAME

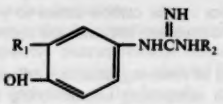
Robert Chung-Huan Liu, and John Lawrence Hughes, both of Kankakee, Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Division of Ser. No. 518,925, Oct. 29, 1974, Pat. No. 4,014,934, which is a continuation-in-part of Ser. No. 460,815, Apr. 15, 1974, Pat. No. 3,908,013, which is a division of Ser. No. 73,244, Sep. 17, 1970, abandoned. This application Jan. 25, 1977, Ser. No. 762,358

Int. Cl.[2] A61K *31/155*

U.S. Cl. 424—326 **6 Claims**

1. A pharmaceutical composition consisting of a pharmaceutical grade carrier and a therapeutically effective vasoconstrictive amount of a guanidine compound of a non-toxic acid addition salt thereof, said compound having the formula:



wherein: R_1 is hydroxyl, methyl or hydroxymethyl; and R_2 is hydrogen or methyl.

6. The method of treating a host requiring vasoconstriction comprising administering to said host from about 1 mg to about 5 mg per kilogram of host body weight of a compound according to claim 1 or a non-toxic acid addition salt thereof to provide vasoconstriction in said host.

4,109,015
PROSTANE DERIVATIVES

Peter Robert Marsham, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

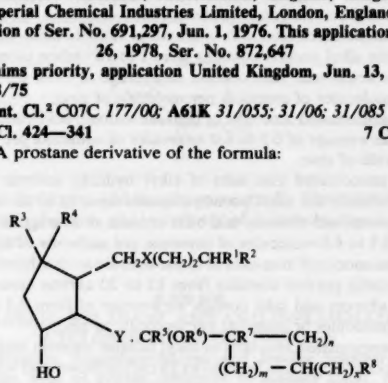
Division of Ser. No. 691,297, Jun. 1, 1976. This application Jan. 26, 1978, Ser. No. 872,647

Claims priority, application United Kingdom, Jun. 13, 1975, 25378/75

Int. Cl.[2] C07C *177/00;* **A61K** *31/055; 31/06; 31/085*

U.S. Cl. 424—341 **7 Claims**

1. A prostane derivative of the formula:



wherein R^1 is hydroxymethyl, R^2, R^5 and R^6 are each hydrogen, R^3 is hydroxy and R^4 is hydrogen, X is ethylene or cis-vinylene, Y is ethylene or trans-vinylene, R^7 is hydrogen or C_{1-4} alkyl, R^8 is phenyl or naphthyl which is unsubstituted or is substituted by halogen, nitro, phenyl, or C_{1-4} alkyl, halogenoalkyl or alkoxy, *m* and *n*, which may be the same or different, are each 1 or 2, and *x* is 0 or 1.

4,109,016
ANAESTHETIC COMPOSITION

John Stewart Moilliet, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 637,680, Dec. 4, 1975, Pat. No. 4,080,389. This application Oct. 31, 1977, Ser. No. 847,026

Claims priority, application United Kingdom, Dec. 6, 1974, 52834/74

Int. Cl.[2] A61K *31/08*

U.S. Cl. 424—342 **3 Claims**

3. A method for producing anaesthesia in a warm-blooded animal which comprises administering by inhalation to said animal an anaesthetically-effective amount of 2-chloro-1,2,2-trifluoroethyl difluoromethyl ether together with sufficient oxygen to maintain respiration.

4,109,017

METHOD FOR CLARIFICATION OF FRUIT JUICE

Ekkehard Grampp, Ober Ramstadt, Darmstadt; Reinhold Schmitt, Zwingenberg, and Reinhold Urlaub, Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 28, 1976, Ser. No. 755,085

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607532

Int. Cl.[2] A23L *2/30*

U.S. Cl. 426—51 5 Claims

1. In a method for the clarification of fruit juice by treatment thereof with pectinase at a temperature between 35° and 55° C. and subsequent settling in the presence of gelatin and silica sol, the improvement which comprises carrying out the settling at a temperature between 35° and 55° C.

4,109,018

LOW CALORIE DIET BREAD

Jerome B. Thompson, Rte. 3, Box 231, Cumberland, Md. 21502

Continuation-in-part of Ser. No. 690,501, May 27, 1976, abandoned. This application Mar. 2, 1977, Ser. No. 773,499

Int. Cl.[2] A21D *2/36, 2/34*

U.S. Cl. 426—62 12 Claims

1. A dough composition for making a bread product, said dough composition comprising wheat flour, water, salt, yeast, fermentable sugar, said dough composition containing from about 3 to about 9 parts by weight of an added vital wheat gluten, from about 5 to about 12 parts by weight of a protein material selected from the group consisting of lowfat soy flour, nonfat dry milk, dried yeast flour, cottonseed flour, and mixtures thereof, from about 10 to about 20 parts by weight of an alpha cellulose flour, and from about 0.5 to about 6 parts by weight of a hydrophilic gum selected from the group consisting of synthetic cellulose ethers, gum guar and gum tragacanth and mixtures thereof, all of said ingredients being expressed as parts by weight per 100 parts of wheat flour.

4,109,019

PROCESS FOR IMPROVED RUMINANT FEED SUPPLEMENTS

William Percy Moore, P.O. Box 943, Hopewell, Va. 23860

Continuation-in-part of Ser. No. 633,029, Nov. 18, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,758

Int. Cl.[2] A23K *1/06, 1/22*

U.S. Cl. 426—69 5 Claims

1. A method for preparation of feeds, highly palatable to ruminant animals, having increased protein equivalent content and said protein equivalent having improved properties of delayed release, by the reaction of fermented proteinaceous agricultural products with carbamides catalyzed by aliphatic dicarboxylic acids comprising:

a. combining one to ten parts fermented proteinaceous agricultural products with one part of carbamide solution containing an aliphatic dicarboxylic acid having between 4 and 6 skeletal carbons, said dicarboxylic acid amounting to between 0.05 and 5.0% of the total reaction mixture, in a first stage reactor fitted with internal rotating blades to provide mechanical mixing and to destroy the physical integrity of the fermented products thereby producing a homogeneous liquid, maintaining reactor temperatures between 70° and 105° C, injecting heated stripping gases amounting to between 10 and 30% by weight of the carbamide solution into the homogeneous liquid to remove low boiling impurities which cause poor feed palatability, venting the stripping gases containing said impurities from the reactor, and retaining the homogeneous liquid reactants in the first stage reactor for a period of time between 1 and 10 minutes;

b. feeding the homogeneous liquid effluent from the first stage reactor to the second stage reactor and spraying the liquid into said second stage reactor as discrete, finely divided droplets;

c. completing the catalytic reaction of the finely divided droplets of carbamide and fermented agricultural products to form solid adduct product particles by fluidizing the said carbamide and fermented agricultural products in an upwardly flowing stream of heated gases, wherein the retention time of the carbamides and fermented agricultural products in the second stage reactor is between 15 and 300 seconds, at temperatures between 85° and 160° C;

d. removing the solid adduct product from the heated zone of the second stage reactor and cooling said product to 40°–70° C.

4,109,020

METHOD OF PRODUCING CRISP REHEATED FRENCH FRIED POTATOES

Harold Gorfien, Framingham; Abdul R. Rahman, Natick, and Donald E. Westcott, Acton, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1977, Ser. No. 812,080

Int. Cl.[2] A23L *1/216*

U.S. Cl. 426—241 7 Claims

1. A method of producing crisp, non-rubbery, reheated french fried potatoes which comprises the steps of par-frying fresh potato pieces in deep fat to a light cream-colored surface appearance, separating the par-fried potato pieces from said deep fat, heating said par-fried potato pieces until the weight thereof is reduced by from about 10 to about 23 percent by weight, further frying said potato pieces in deep fat at about 375° F. for from about 1 to about 3 minutes, separating said potato pieces from said deep fat, freezing said potato pieces, storing said potato pieces in the frozen state until time for consumption thereof, and heating said potato pieces with microwave energy sufficiently to render them palatable.

4,109,021

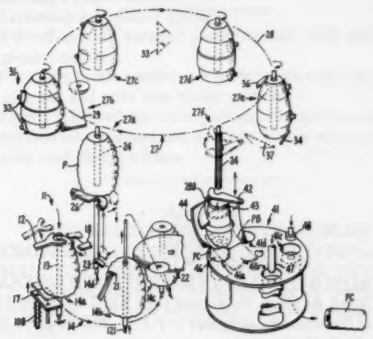
METHOD OF PEELING PINEAPPLES

Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Division of Ser. No. 697,779, Jun. 21, 1976. This application Apr. 11, 1977, Ser. No. 786,614

Int. Cl.[2] A23L *1/212;* A23N *7/00;* A23P *1/00*

U.S. Cl. 426—482 5 Claims



1. A method for processing pineapples comprising, centering a pineapple about its core axis, positioning the pineapple with its core extending in a predetermined direction, moving the pineapple along a path in alignment with said predetermined direction using a pineapple moving means, forming a hole centrally of the pineapple and of a diameter less than the fibrous central core of the pineapple using a coring means, said coring means being adjacent a yielding means, said yielding means engaging the pineapple while it is being cored and

yieldably resisting movement of the pineapple in said predetermined direction, moving a height setting finger over the pineapple higher than the upper end of the pineapple, disengaging the pineapple moving means from the pineapple, whereupon the yielding means moves the pineapple relative to the coring means in a direction opposite to said predetermined direction until the pineapple contacts the height setting finger thus spacing an end of the pineapple from the coring means to enable cutting of said end from the pineapple, severing one end from said pineapple on a plane normal to the core axis, transferring the pineapple to an indexable turret, supporting the transferred pineapple upon said central hole, indexing said turret to advance said pineapple to a first peeling station, rotating said pineapple about its core axis at said peeling station, peeling spaced circumferential bands from the outer surface of said rotating pineapple to a predetermined depth while maintaining the ovoid profile of the pineapple, indexing said turret to advance said pineapple to a second peeling station, severing the other end from said pineapple on a plane normal to the core axis as said pineapple is moved to said second peeling station, rotating said pineapple about its core axis at said second peeling station, peeling the remaining outer surface between said first peeled spaced bands to blend the peeled areas smoothly while maintaining the ovoid profile of the pineapple, trimming the juncture of said ends and ovoid peeled surface of the pineapple in a plane substantially bisecting the included angle formed at said juncture by an intersection of each end and a peeled surface to a depth required to remove any remaining eyes, the juncture formed adjacent said other end being trimmed with a fixed trimming means and the juncture formed adjacent said one end being trimmed with a movable trimming means, the position of said movable trimming means being adjusted in accordance with the height of the pineapple undergoing peeling, and transferring said peeled pineapple from said indexable turret.

4,109,022

FLAVORING WITH TRANS, E-1-CROTONOYL-2,2,6-TRIMETHYLCYCLOHEXANE

Douwe Rienk de Haan, Soest, and Dirk Karel Kettenes, Putten, both of Netherlands, assignors to P.F.W. Beheer B.V., Amersfoort, Netherlands

Filed Apr. 28, 1976, Ser. No. 681,202

Claims priority, application United Kingdom, Oct. 26, 1972, 49368/72

Int. Cl.[2] A23L *1/235*

U.S. Cl. 426—538 **8 Claims**

1. A fruit flavoring composition, for flavoring a food product, to which has been added trans, E-1-crotonoyl-2,2,6-trimethylcyclohexane in an amount which is effective to impart a fresh, fruity flavor to said flavoring composition.

4,109,023

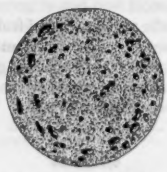
POROUS YEAST LEAVENED DOUGH PRODUCT

Dugan Allan Rucker, Kansas City, Mo.; Louis Albert Wollermann, Prairie Village, and Jack Kern Krum, Leawood, both of Kans., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,189

Int. Cl.[2] A21D *2/14, 2/36*

U.S. Cl. 426—549 **4 Claims**



1. A yeast leavened dough product having a high and uniform level of porosity containing for each 100 parts by weight of flour from about 0.20 to 5.0 parts by weight of rice flour and from about 0.06 to 1.0 part by weight of fumaric acid.

4,109,024

POTATO PRODUCT

Charles W. Cremer, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Division of Ser. No. 432,777, Jan. 11, 1974, Pat. No. 3,987,210, which is a continuation of Ser. No. 874,037, Nov. 4, 1969, abandoned. This application Jun. 28, 1976, Ser. No. 700,628

Int. Cl.[2] A23L *1/10*

U.S. Cl. 426—550 **10 Claims**

1. An edible dry potato product for use in producing French fried potatoes from finely divided dehydrated potatoes comprising: (A) between 50% and 92% by weight of dehydrated potatoes of a particle size less than 5 mesh sieve (U.S. sieve series), (B) between 5% and 45% by weight of high-amylose starch characterized as containing more than 35% by weight amylose, (C) between 1% and 30% weight of a cold-water-dispersible starch characterized as having a starch pasting temperature of less than 120° F. and serving as a binder for the potato product when the dry potato product is mixed with water at a mixing temperature of less than 120° F., and (D) less than 15% by weight of taste- and texture-modifying components.

4,109,025

PROTEIN ENRICHED BAKED GOODS

Robert M. Lauck, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 15, 1976, Ser. No. 750,947

Int. Cl.[2] A21D *2/34, 13/08*

U.S. Cl. 426—551 **10 Claims**

1. A process for preparing a leavened dough mixture for the production of leavened baked goods normally containing shortening which comprises replacing at least part of the shortening requirement of said baked goods with a whey protein concentrate containing at least 25% protein wherein the protein is substantially undenatured and non-oxidized, said concentrate being in an amount effective to improve the volume of said baked goods.

4,109,026
PROCESS FOR PRODUCING COMPACTED, DEHYDRATED, UNCOOKED CABBAGE AND CABBAGE PRODUCT THEREOF

Abdul R. Rahman, Natick, and Stephen G. Haralampu, Belmont, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 25, 1977, Ser. No. 818,701
Int. Cl.[2] A23B *7/02, 7/06, 7/14*
U.S. Cl. 426—640 **5 Claims**

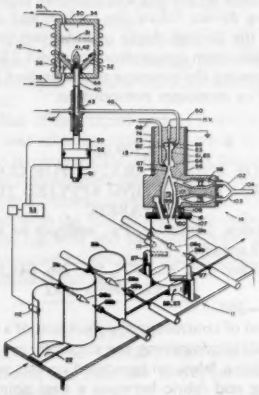
1. A process for the preparation of compacted, dehydrated, uncooked cabbage, which comprises the steps of:

a. subdividing the leaves of fresh cabbage,
b. covering the subdivided cabbage with a solution of sodium metabisulfite,
c. removing the excess of said solution of sodium metabisulfite from said cabbage,
d. blanching the subdivided cabbage with heated air beginning with air at a temperature of about 90°–95° C. and gradually decreasing the temperature of said air to about 50°–60° C. over a period of about 15–25 minutes at a rate substantially in a straight line relation to the time elapsed,
e. partially drying said cabbage by means of heated air at about 50°–75° C. until the moisture content of said cabbage is from about five to about eight percent by weight,
f. partially rehydrating said cabbage by applying thereto an aqueous solution of a food grade surface-active agent selected from the group consisting of polyoxyethylene sorbitan monostearate and polyoxyethylene sorbitan monooleate until the moisture content of said cabbage is increased to from about 10 to about 20 percent,
g. equilibrating said aqueous solution of said surface-active agent throughout said cabbage,
h. compressing said cabbage to a compression ratio of from about 7:1 to about 15:1, and
i. redrying the compressed cabbage by means of heated air until its moisture content is no greater than 5 percent.

4,109,027
ELECTROSTATIC COATING APPARATUS AND METHOD

James R. Crose, Chelmsford, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 21, 1976, Ser. No. 651,162
Int. Cl.[2] B05D *1/06;* **B05B** *5/02*
U.S. Cl. 427—28 **13 Claims**

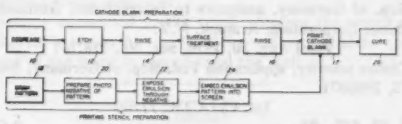


1. An electrostatic powder deposition method comprising entraining particles of powder in gas; thereafter supplying a like charge to the particles of powder by feeding the gas entrained powder into a cylindrical chamber having two enlarged symmetrical bell subchambers and a narrower connecting throat all aligned on a longitudinal axis, and an ejection opening centered in the outer end of one of the enlarged bells on the longitudinal axis, and circulating the powder about an electrode that extends through the chamber on the chamber's longitudinal axis, the entrained powder being fed into the outer end of the enlarged bell not having the ejection opening along its outer cylindrical surface in a first vortex direction of rotation and toward the throat and additional gas being fed into the outer end of the opposite enlarged bell in a second vortex having a reverse direction of rotation and toward the throat, bringing about a reaction between the vortexes by causing them to come together causing oscillatory movement of the particles of the entrained powder, providing improved exposure to electrical charging and a pulsing of the entrained powder and gas out the ejection opening; thereafter injecting the charged powder into the enclosure having an open volume therein bounded by at least one wall; sealing the enclosure with substantially all of the powder in the open volume and thereafter depositing the powder on said wall due to the charge on the particles.

4,109,028
FABRICATION OF CATHODES FOR ELECTRODEPOSITION

Edwin Lewis Owen, Concord, and David William Marshall, North Reading, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 716,838, Aug. 23, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 804,996
Int. Cl.[2] C25D *1/04*
U.S. Cl. 427—58 **14 Claims**



1. The method of preparing a cathode for use in the electroforming of thin metallic filaments in a predetermined pattern comprising the steps of

(a) partially masking a porous planar member to provide a masked region corresponding to said predetermined pattern;
(b) providing an electrically conductive metal cathode base having a planar surface;
(c) cleaning said planar surface;
(d) overlying the cleaned planar surface with said porous planar member;
(e) printing a non-conductive material through said porous member and onto said planar surface;

whereby said predetermined pattern is formed on said planar surface intermediate said non-conductive material printed onto said planar surface.

4,109,029
HIGH RESOLUTION ELECTRON BEAM MICROFABRICATION PROCESS FOR FABRICATING SMALL GEOMETRY SEMICONDUCTOR DEVICES

Faik S. Ozdemir, Thousand Oaks, and Dall D. Loper, Fresno, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 24, 1977, Ser. No. 761,934
Int. Cl.[2] H01L *29/48*
U.S. Cl. 427—84 **13 Claims**

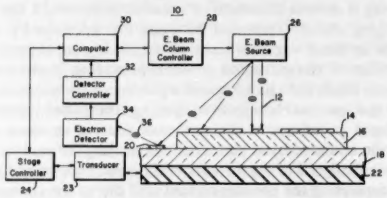
1. A process for fabricating small geometry semiconductor devices having contact electrodes of different metals or metal alloys comprising the steps of:

(a) forming a first mask on the surface of a semiconductor body and having one or more openings therein positionally referenced to a first alignment mark,

(b) depositing at least one metal electrode in one of said openings to thereby form one type of electrical contact at the surface of said semiconductor body,

(c) depositing a second alignment mark in another of said openings so that said second alignment mark is registered to said one or more openings in said first mask,

(d) forming a second mask on the surface of said semiconductor body and having an opening therein which is positionally referenced to said second alignment mark, and



(e) depositing another metal electrode in said second opening to thereby form a different type of metal contact on the surface of said semiconductor body and precisely spaced from said one metal electrode, whereby both of said metal electrodes are referenced to said second alignment mark.

4,109,030

METHOD FOR THERMALLY OXIDIZING SILICON

Marian Briska, and Ewald Eisenbraun, both of Boeblingen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,747

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1975, 2550371

Int. Cl.[2] C23C *11/00*

U.S. Cl. 427—93 **9 Claims**

1. A method of thermally oxidizing a silicon substrate comprising:

heating said substrate to elevated temperatures between about 900° to about 1100° C, and

exposing said heated substrate to an atmosphere wherein the gaseous reactants consist essentially of oxygen and nitrosyl chloride in the range of about 1:1 to about 20:1.

4,109,031

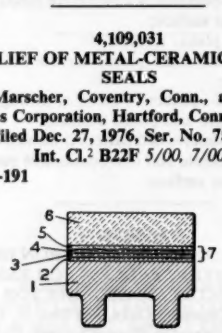
STRESS RELIEF OF METAL-CERAMIC GAS TURBINE SEALS

William D. Marscher, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1976, Ser. No. 754,669

Int. Cl.[2] B22F *5/00, 7/00*

U.S. Cl. 427—191 **4 Claims**



1. A process for modifying the magnitude of the thermal stresses between the metal and ceramic components of a bonded article having an interlayer of mixed metal-ceramic composition between the metal and ceramic components with the interlayer having a characteristic softening temperature, which comprises:

(a) providing an article consisting of a metal component and a ceramic component separated by an interlayer of mixed metal-ceramic composition;

(b) heating the article to a temperature in excess of the softening point of the intermediate layer;

(c) preferentially cooling the metal component to a temperature below the softening temperature of the intermediate layer while the ceramic component and intermediate layer remain at a temperature above the softening point of the intermediate layer; and

(d) allowing the article to cool at a substantially uniform rate until the entire article is below the softening point of the intermediate layer.

4,109,032

METHOD FOR TREATING LIGHTWEIGHT, NON-CEMENTITIOUS BUILDING MATERIAL

Jeffery L. Barrall, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 23, 1976, Ser. No. 744,273

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—255 **6 Claims**

1. A process for inhibiting efflorescence of a cement-free, sodium silicate/inorganic aggregate composition which comprises treating said composition with a reactive silane of the formula R_nSiCl_m wherein R is C_1 to C_4 alkyl, C_1 to C_4 alkoxy or mixtures thereof, and n and m are 0 to 4, with the proviso that when m is 0 at least one R is C_1 to C_4 alkoxy.

4,109,033

PROCESS FOR IMPREGNATING CONCRETE WITH POLYMERS

Paul R. Blankenhorn, 106 Horseshoe Cir., Pennsylvania Furnace, Pa. 16865; Philip D. Cady, P.O. Box 158, Lemont, Pa. 16851; Donald E. Kline, 1210 E. Branch Rd., State College, Pa. 16801, and Richard E. Weyers, 3276 Highridge Trail, Madison, Wis. 53713

Continuation-in-part of Ser. No. 584,249, Jun. 6, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,022

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—314 **8 Claims**

1. In the process of impregnating large volumes of concrete in the field, such as roadbeds, walkways, and bridge decks, with a polymer or a monomer for in situ polymerization wherein it is necessary to dry said concrete prior to impregnation, the improvement of employing a temperature measurement to determine moisture content which comprises

(1) determining the appropriate dryness for impregnation of said concrete by heating said concrete until a temperature-indicating device below the surface and within the concrete at the desired depth of monomer penetration indicates a minimum temperature of about 230° F., and

(2) impregnating the concrete to the desired depth with said polymer or monomer composition.

4,109,034

METHOD OF AND APPARATUS FOR CONTROLLING THICKNESS OF COATING APPLIED TO MOVING FABRIC

Henry W. Welch, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 12, 1977, Ser. No. 841,304

Int. Cl.[2] B05D *3/12*

U.S. Cl. 427—355 **3 Claims**

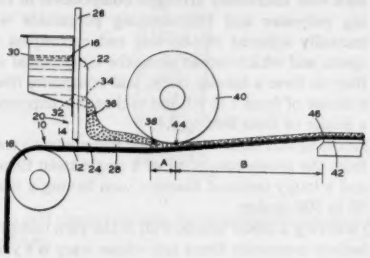
1. A method of controlling the thickness of a coating applied to moving fabric comprising the steps of:

(a) providing a fabric to be coated on one side,

(b) moving said fabric between a first point and a second point with the side of said fabric to be coated facing up, said fabric having no support under its lower side as it moves between said first and second points,

(c) depressing said moving fabric across its width at a point intermediate said first and second points so that the upper side of the fabric at said intermediate point is below a plane through said first and second points,

(d) applying a coating onto the upper side of said moving fabric adjacent said intermediate point between said intermediate point and said second point, while said moving fabric remains depressed at said intermediate point, and



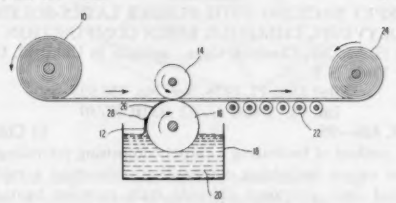
(e) controlling the thickness of the applied coating across the fabric's width at a point adjacent the coating application location such that the distance between the intermediate point and the second point is several orders magnitude greater than the distance between the intermediate point and the point where the thickness is being controlled.

4,109,035

TENSION WIRE METERING OF APPLICATOR ROLL

Rolf Edward Christensen, Wallingford, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 19, 1977, Ser. No. 788,778
Int. Cl.[2] B05D *1/28;* B05C *1/12*
U.S. Cl. 427—365 **3 Claims**



1. In the method of manufacturing a heat activatable fabric conditioning product comprising:
feeding a flexible absorbent substrate to a nip formed by a rotating upper roller and a rotating lower roller;
applying a quantity of liquid, fabric conditioning agent to the lower roller;
doctoring a film of said liquid on said lower roller;
compressing said substrate in said nip while in contact with said film to impregnate the liquid into the substrate, and
removing said impregnated substrate from said nip;
wherein the improvement comprises tension wire doctoring the liquid to form the film on the lower roller by setting a gap between the wire and the lower roller and, the wire being unsupported except at its end sections, retaining the gap by tensioning the wire.

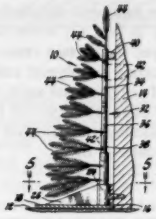
4,109,036

ARTIFICIAL CHRISTMAS TREE

Gary Richard Lloyd, and Rita Rae Lloyd, both of 11438 Elm, Taylor, Mich. 48180

Filed Apr. 15, 1977, Ser. No. 787,896
Int. Cl.[2] A47G *33/06*
U.S. Cl. 428—8 **1 Claim**

1. In combination with a horizontal floor and a vertical wall, an artificial Christmas tree comprising:
a horizontal base plate disposed on the floor;
a tubular member supported in a vertical position with its lower edge attached to the base plate such that the upper end of the tubular member forms a socket;
fastener means for connecting the tubular member to the vertical wall adjacent the floor such that the fastener means cooperate with the base plate in preventing movement of the tubular member away from the wall;
an elongated trunk having a lower end and an upper end, the lower end being removably received in the socket such that the trunk is disposed in a substantially vertical position adjacent the wall, said trunk having a plurality of longitudinally spaced branch-receiving openings;



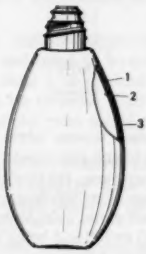
a plurality of branches, each being received in a branch-receiving opening so as to be supported about the longitudinal axis of the trunk in an arc less than 360° but greater than 90° such that the branches collectively cooperate in simulating the foilage of a Christmas tree;
the upper end of the trunk being horizontally movable with respect to the wall; and
a bumper connected to the trunk adjacent the upper end thereof between the trunk and the wall such that the upper end of the trunk is spaced from the wall.

4,109,037

LAMINATED PACKING MATERIALS

Shigezo Nohara, Yokohama, Japan, assignor to Toyo Seikan Kaisha, Ltd., Japan

Continuation-in-part of Ser. No. 463,173, Apr. 22, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,584
Claims priority, application Japan, Apr. 30, 1973, 48-47753
Int. Cl.[2] B65D *1/00;* B32B *27/08*
U.S. Cl. 428—35 **7 Claims**



1. A laminated packing material which comprises at least one layer A containing resinous material A and at least one layer B containing resinous material B, said layers A and B having been extruded simultaneously and heat-bonded together so that at least one layer A is in direct contact with at least one layer B, said resinous material A containing more than 50 mole % of acrylonitrile units, said resinous material B being a member selected from the group consisting of polyethylene, polypropylene and an ethylene-vinyl acetate copolymer containing not greater than 8 mole % of vinyl acetate units, at least one of any of said layers A and B further containing an additive selected from the group consisting of (1) ethylene-

vinyl acetate copolymers containing more than 5 mole % of vinyl acetate units and (2) ionomers prepared by adding a metal hydroxide, metal lower alcoholate or metal salt of a lower aliphatic acid to a copolymer of a major proportion of ethylene and minor proportion of acrylic acid or methacrylic acid,

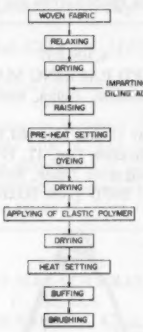
with the provisos that (1) when said additive is contained in said layer A, then there are from 2 to 30 parts by weight of said additive in said layer A based on 100 parts of said resinous material A, (2) when said additive is contained in said layer B and said resinous material B is polyethylene or polypropylene, then there are from 2 to 15 parts by weight of said additive in said layer B based on 100 parts of said resinous material B, and (3) when said additive is contained in said layer B and said resinous material B is an ethylene-vinyl acetate copolymer containing not greater than 8 mole % of vinyl acetate units, then said additive is said ionomer and there are from 2 to 15 parts by weight of said additive in said layer B based on 100 parts by weight of said resinous material B.

4,109,038

SUEDE-LIKE RAISED WOVEN FABRIC AND PROCESS FOR THE PREPARATION THEREOF

Kazushige Hayashi, Ibaraki; Iwao Fujimoto, Waki; Toshio Morishita, Iwakuni; Norihiro Minemura; Norio Yoshida, both of Ibaraki; Kiyotaka Ozaki, Iwakuni, and Takanori Shinoki, Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 23, 1977, Ser. No. 799,818
Claims priority, application Japan, Mar. 17, 1977, 52-28627
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—91 **12 Claims**



1. A suede-like raised woven fabric of interwoven warp yarns and weft yarns which comprises:

(a) a plurality of warp yarns, the total denier of a single warp yarn ranging from 50 to 300 denier;

(b) a plurality of weft yarns, a single weft yarn having a total denier of from 50 to 500 and being a single twist filament yarn, a loopy textured filament yarn or mixtures thereof, and constituted of a bundle of fine fibers obtained from hollow composite fibers, each composed of at least four alternating segments of fiber forming polyester and fiber forming polyamide components which are mutually adhered side-by-side and encompass a hollow space, and which extend along the longitudinal axis of the fiber to form a tubular body, said bundle of fine fibers having raised and unraised portions, the hollow composite fibers in the raised portions being separated into fine fibers having an average monofilament denier of from 0.05 to 0.4 denier and the hollow composite fibers in the unraised portions being separated into fine fibers having an average monofilament denier of above 0.4 but not exceeding 0.8 denier; and

(c) an elastic polymer applied thereto.

6. A process for the preparation of a suede-like raised woven fabric which comprises the steps of:

(1) providing hollow composite fibers, each composed of at least four alternately arranged components of fiber-forming polyester and fiber-forming polyamide which are mutually adhered side-by-side and encompass a hollow space, and which extend along the longitudinal axis of the fiber to form a tubular body, said composite fiber having a denier of from 1 to 10, and said each component having a denier of from 0.05 to 0.4;

(2) forming said hollow composite fibers into a yarn selected from the group consisting of a single twist filament yarn and a loopy textured filament yarn having a size of from 50 to 500 denier;

(3) weaving a fabric whose weft is the yarn comprising said hollow composite fibers and whose warp is a yarn having a size of from 50 to 300 denier;

(4) dividing said hollow composite fibers constituting said weft yarn into fine fibers to form a bundle of fine fibers by a raising operation, wherein said bundle of fine fibers consists of raised and unraised portions, the average monofilament denier of said raised portion being in the range of from 0.05 to 0.4 denier and the average monofilament denier of said unraised portion being in a range of above 0.4 but not exceeding 0.8 denier;

(5) applying a solution of an elastic polymer to said fabric; and

(6) solidifying said elastic polymer.

4,109,039

CARPET BACKING WITH RUBBER LATEX-SOLID POLYVINYL CHLORIDE RESIN COMPOSITION

Robert H. McCoy, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Oct. 27, 1976, Ser. No. 736,025
Int. Cl.[2] D05C *17/02*; B32B *27/30*
U.S. Cl. 428—95 **11 Claims**

1. A method of backsizing a carpet comprising providing an aqueous carpet backsizing composition comprising a rubber latex and solid polyvinyl chloride resin particles having a weight average particle size of from 85 to 150 microns, the weight ratio of dry rubber solids to polyvinyl chloride resin being within the range of from 85:15 to 55:45, applying the said aqueous composition to the back of the carpet, and thereafter drying the applied composition at an elevated temperature below the flux temperature of the polyvinyl chloride resin to provide a carpet backsized with the said composition in a non-cellular state.

4,109,040

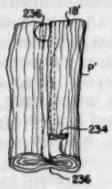
CUSHIONING DUNNAGE PRODUCT PRODUCED FROM CUSHIONING DUNNAGE MECHANISM

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corporation, Eastlake, Ohio

Division of Ser. No. 573,615, May 1, 1975, Pat. No. 3,923,048. This application Nov. 22, 1976, Ser. No. 743,704
Int. Cl.[2] B32B *3/04*
U.S. Cl. 428—129 **5 Claims**

1. A machine produced lightweight compressible flexible cushioning dunnage product of pad-like configuration formed from a plurality of superimposed webs of separate paper sheets, the lateral edges of which have been rolled loosely inwardly into generally abutting relation, and then crumpled generally radially inwardly, and comprising a central compressed section running lengthwise for the length of the product and lateral pillow-like sections, and pressure sensitive adhesive means formed integral on the outermost web initially adjacent a

lateral edge thereof and coacting therewith in said central section of said product for aiding in maintaining said abutting



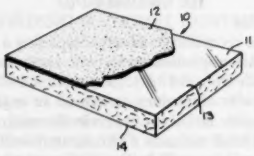
relation in said central section, for retaining the product in said pad-like form.

4,109,041

CONSTRUCTION PANEL WITH NON-SKID SURFACE AND METHOD OF FABRICATION

Stephen J. Tellman, Patterson, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 708,306, Jul. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,346, Oct. 30, 1975, which is a continuation of Ser. No. 488,709, Mar. 6, 1974, abandoned. This application Nov. 4, 1977, Ser. No. 848,485
Int. Cl.[2] B32B *5/16*
U.S. Cl. 428—147 **14 Claims**



1. An improved construction panel comprising:
a structural sheet of material selected from the group consisting of particleboard, hardboard, plywood, fiberboard, and combinations thereof, said sheet having at least one smooth surface; and
a layer of elastomeric particles generally uniformaly distributed over and bonded to at least one smooth surface of said sheet, said particles being separated to expose a substantial part of said surface and being of a size which effectively preserves the smoothness of said surface while imparting a non-slip characteristic thereto.

9. The method of producing a particleboard panel comprising the steps of generally uniformly distributing elastomeric particles on a caul plate in an amount in the range of from about 10 to about 20 pounds of particles per one thousand square feet of caul plate area, said particles forming a thin layer of spaced particles, depositing wood flakes admixed with a binder over said particles to form a composite mat, and curing said binder to form said particleboard panel while bonding said elastomeric particles to the surface thereof.

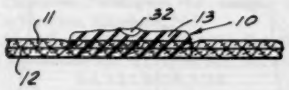
13. The method of producing a particleboard panel comprising the steps of depositing wood flakes admixed with a binder on a caul plate to produce a mat, prepressing said mat, generally uniformly distributing elastomeric particles over a surface of the prepressed mat in an amount in the range of from about 10 to about 20 pounds of particles per one thousand square feet of mat surface, said particles forming a thin layer of spaced particles which expose a substantial part of the mat surface, and curing said binder to form said particleboard panel while bonding said elastomeric particles to the surface thereof.

4,109,042

BEAD SEAM CONSTRUCTION AND METHOD OF FORMING

Lewis W. Estes, and Paul W. Johns, both of Kewanee, Ill., assignors to The Schaffer Company, Kewanee, Ill.

Filed Nov. 8, 1976, Ser. No. 739,731
Int. Cl.[2] B32B *3/02*
U.S. Cl. 428—193 **12 Claims**



1. A seam construction, comprising:
(a) a pair of juxtaposed layers of porous sheet material in contact with each other; and
(b) a bead of cured nitrile latex material disposed on one side of one of said layers remote from the other layer, a portion of said bead material extending transversely through said one layer and transversely into the pores of said other layer, at least one edge of said bead being sharply defined by the substantial absence of bead material in the immediately adjacent porous sheet material.

4,109,043

LOW PRESSURE MELAMINE RESIN LAMINATES

Darwin Fiske DeLapp, New Canaan, Conn., assignor to Formica Corporation, Cincinnati, Ohio

Filed Feb. 11, 1977, Ser. No. 767,719
Int. Cl.[2] B32B *27/42, 3/10, 5/16*
U.S. Cl. 428—206 **10 Claims**

1. A heat and pressure consolidated article comprising
A. a self-supporting substrate and
B. a decorative, cellulosic paper sheet having a basis weight of at least about 40 pounds per 3,000 square foot ream, containing at least about 60% α-cellulose and being impregnated with a composition of matter comprising a mixture of
1. an aqueous melamine/formaldehyde resin solution wherein the melamine to formaldehyde ratio thereof ranges from about 1:1.6 to about 1:2.5,
2. from about 2.5% to about 30.0%, by weight, based on the weight of the resin solids of (1), of an elastomer comprising
a. an ethylene/vinyl chloride copolymer containing a comonomer supplying from about 0.5% to about 7.0%, by weight, based on the total weight of (a), of amide groups,
b. a polyurethane resin containing from about 3.0% to about 10.0%, by weight, based on the total weight of (b), of carboxyl groups, or
c. a butadiene/acrylonitrile polymer containing from about 1% to about 10%, by weight, based on the total weight of (c), of carboxyl groups, said elastomer having a particle size of up to about 20,000 Angstroms, and
3. from about 0.25 to about 1.25%, by weight, based on the total weight of solids in said composition, of an alkylene polyamine having the formula

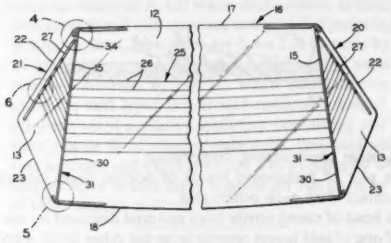
$$H_2N—CH_2CH_2NH]_nCH_2CH_2NH_2$$

wherein n is a whole, positive integer of 0–3, inclusive.

4,109,044
ELECTRICALLY HEATED WINDOW HAVING SHARPLY BENT PORTIONS

James G. Marriott, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Aug. 27, 1976, Ser. No. 718,154
Int. Cl.[2] C03B *23/02;* H05B *3/06*
U.S. Cl. 428—210 12 Claims

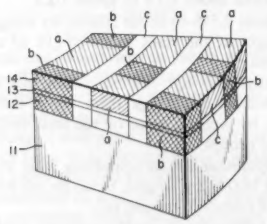


1. A glass sheet adapted to be sharply bent about at least one line extending transversely of said sheet comprising: a first circuit formed of electrically conducting material imprinted on one surface of said glass sheet and including a pair of bus bars and a plurality of spaced electrically conducting lines extending between and connected at their opposite ends to said bus bars, at least one electrically conducting path formed of electrically conducting material imprinted on said one surface between said bus bars and coincident with the line about which it is desired to bend the sheet, said electrically conducting path extending transversely across and intersecting said conducting lines and adapted to be connected at the opposite ends thereof to a source of power to form a second circuit on said glass sheet surface, each of said bus bars being interrupted to form discontinuities on opposite sides of each connection between said conducting lines and said bus bars, respectively.

4,109,045
INFORMATION RECORDING MEDIUM

Takeshi Goshima, Tokyo, and Kiyonobu Endo, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 411,733, Nov. 1, 1973, abandoned. This application Nov. 8, 1976, Ser. No. 739,988
Claims priority, application Japan, Nov. 6, 1972, 48-110943
Int. Cl.[2] H04N *5/76, 5/84*
U.S. Cl. 428—212 5 Claims



1. A recording medium which comprises:
(a) a base;
(b) a first layer disposed directly on said base, said first layer being selectively sensitive to a first irradiated light beam such that the exposed portions and the unexposed portions of said first layer have different solubilities in a given solvent to permit either the exposed or the unexposed portions to be removed;
(c) a second layer disposed above said first layer, said second layer being selectively sensitive to a second irradiated light beam such that the exposed portions and the unexposed portions of said second layer have different solubilities in a given solvent to permit either the exposed or unexposed portions to be removed and wherein said second layer is substantially transmissive at least with respect to the first irradiated light beam to permit exposure of said first layer by the first light beam; and
(d) an intermediate layer interposed between said first and second layers to prevent direct contact of said first and second layers, said intermediate layer being chemically non-reactive with and incapable of diffusing into such first and second layers, wherein said intermediate layer is substantially transmissive at least with respect to the fist irradiated light beam to permit exposure of said first layer to the first irradiated light beam which passes through said second layer and is sensitive to one of the irradiated beams, the sensitivity of said intermediate layer being at a level between that of said first layer and that of said second layer.

4,109,046
FLEXIBLE MULTI-LAYER MAGNETIC RECORDING MEDIA

Fritz Hammon; Manfred Ohlinger; Horst Grosselfinger, all of Frankenthal; Heinz Stritzinger; Job-Werner Hartmann, both of Ludwigshafen, all of Fed. Rep. of Germany; Eduard Schoenafinger, Jenesien, Italy, and Walter Schneider, Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

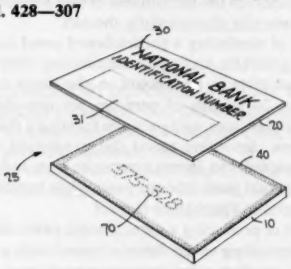
Filed Dec. 3, 1976, Ser. No. 747,355
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556188
Int. Cl. H01f *10/02*
U.S. Cl. 428—216 1 Claim

1. A magnetic recording medium comprising a non-magnetic flexible base and, applied thereto, two superposed magnetizable layers, each from 0.3 to 15 μm thick, of a homogeneous mixture of acicular chromium dioxide in an organic synthetic binder with further additives, wherein the magnetizable layer adjacent to the base contains a chromium dioxide with a specific surface area, measured by the BET method, of from 15 to 25 m^2/g and the outer magnetic layer contains a chromium dioxide with a specific surface area, measured by the BET method, of from 26 to 35 m^2/g.

4,109,047
RUB-ON SECURITY CARDS

Donald M. Fredrickson, Williamsville, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Jul. 6, 1977, Ser. No. 813,247
Int. Cl.[2] B41M *5/00, 5/12*
U.S. Cl. 428—307 36 Claims



1. A multilayered card which contains initially invisible information that is capable of becoming permanently visible in the shape of information-relaying indicia upon pressure treatment of the card, the construction of the card being such that any information development and detection by either an autho-

rized or an unauthorized person becomes manifestly and permanently evident, said card comprising:

a first layer;

a second layer coextensively arranged in an overlying adjacent relationship to said first layer;

a first initially colorless, color developer composition disposed in a first continuous coating between the inner facing surfaces of said first and second layers; and

a second initially colorless, color precursor compound disposed in a second continuous coating between said inner facing surfaces of said first and second layers adjacent said first continuous coating, said color developer composition and said color precursor compound being capable of interreacting chemically when pressed into intimate contact to produce a colored mark and being disposed to be pressed into such contact upon the application of pressure to an outer, exposed surface of at least one of said first and second layers;

and an initially colorless desensitizing substance disposed on one of said coatings in a configuration which presents said correspondingly configured material, said substance being capable of preventing said interreaction in the areas of said coatings in contact therewith to thus form said information-relaying indicia.

3. The card of claim 1 wherein said substance is on said first coating and functions by neutralizing the color-developing properties of the underlying composition.

8. The card of claim 3 wherein said second coating comprises a multiplicity of minute, discrete pressure-rupturable microcapsules containing said compound.

4,109,048

RECORDING MATERIAL CONTAINING GAMMA-ALUMINA

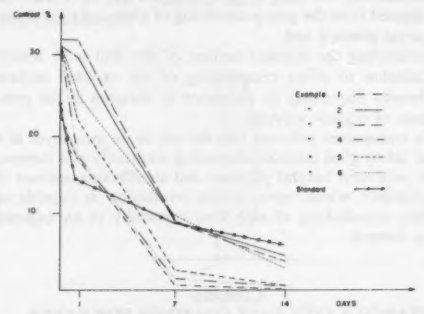
Guido Dessauer, Dusseldorf-Gerresheim; Kurt Ramlow, Schaffiund; Kurt Riecke, Kempen, and Franz Wirnitzer, Flensburg, all of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Düsseldorf-Oberkassel, Fed. Rep. of Germany

Filed Jan. 18, 1977, Ser. No. 760,274

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601865

Int. Cl.² B32B *5/16;* **B41M** *5/16*

U.S. Cl. 428—325 **11 Claims**



1. In a recording material including a fibrous web and a pigment composition secured to the fibers of said web and capable of converting a substantially colorless member of the group consisting of crystal violet lactone, malachite green lactone, benzoyl leuco methylene blue, and N-phenyl-leukauramine to a colored dye, the improvement in the pigment composition which consists in said composition including at least 10 percent by weight of a mixture of γ-alumina and precursors of γ-alumina, said mixture containing 1 to 30 percent chemically bound water volatile at 1000° C, and said precursors being hydrated forms of aluminum oxide capable of being converted substantially completely to γ-alumina when heated from 300° to 1000° C.

4,109,049

COLOR DEVELOPING COATING USING UNREFINED CLAYS ON PAPER

Thomas D. Thompson, Flemington, N.J., assignor to Yara Engineering Corporation, Elizabeth, N.J.

Division of Ser. No. 606,975, Aug. 22, 1975, Pat. No. 4,022,735. This application Apr. 27, 1976, Ser. No. 680,723

Int. Cl.² B32B *5/16*

U.S. Cl. 428—331 **4 Claims**

1. A color developing coated paper comprising a paper sheet having applied thereto a coating consisting essentially of a mixture of a dispersing agent, a paper coating adhesive and a reactive pigment consisting essentially of a mixture of a salt of a polyvalent cation, a ligand, kaolinite and a member selected from the group unrefined bentonite and unrefined montmorillonite.

4,109,050

COATED SILICON-BASED CERAMIC COMPOSITES AND METHOD FOR MAKING SAME

Richard L. Mehan, Scotia, and Charles R. Morelock, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1976, Ser. No. 748,930

Int. Cl.² B32B *9/04*

U.S. Cl. 428—332 **7 Claims**

1. A method of reducing the tendency of a silicon-based ceramic, selected from the class consisting of a silicon carbide containing ceramic, and a silicon nitride containing ceramic, from reacting with a metallic surface at elevated temperatures to form metallic silicides which comprises

(1) etching the surface of the silicon-based ceramic composite to effect the removal of surface silicon,

(2) substantially filling the cavity of the resulting etched silicon-based ceramic composite formed during step (1) with an inorganic oxide mixture comprising a blend of aluminum oxide and silicon oxide and

(3) firing the treated silicon-based ceramic of (2) to a temperature of up to 1250° C resulting in the conversion of the inorganic oxide mixture to an adherent ceramic coating.

4,109,051

POLYHYDROXY AROMATIC COATING COMPOSITIONS FOR REINFORCING GLASS FIBERS USED IN CEMENTITIOUS PRODUCTS

David Ralph Cockram, Wigan, England, assignor to Pilkington Brothers Limited, St. Helens, England

Division of Ser. No. 485,659, Jul. 3, 1974, Pat. No. 3,954,490. This application Jan. 6, 1976, Ser. No. 646,785

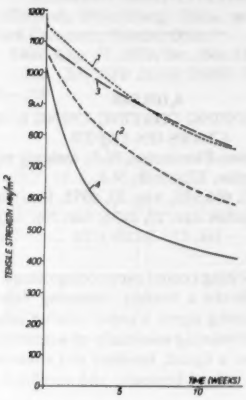
Claims priority, application United Kingdom, Jul. 3, 1973, 31657/73

Int. Cl.² C04B *7/02;* **D02G** *3/00*

U.S. Cl. 428—375 **34 Claims**

1. Glass fibres for use as reinforcement in cementitious products, said fibres being coated with a composition which consists essentially of a protective material to reduce deterioration of the glass fibres, said protective material being non-polym-

eric, a monocyclic or polycyclic aromatic compound which has at least three hydroxyl groups on the aromatic ring or



when a polycyclic compound is employed, on at least one of the aromatic rings.

4,109,052

ELECTROCONDUCTIVE TRANSPARENCY

Jerrel Charles Anderson, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 12, 1977, Ser. No. 796,185
Int. Cl.[2] B32B *15/08, 27/36;* B44F *1/06;* G03G *7/00*
U.S. Cl. 428—409 **12 Claims**

1. A laminate film having an optical transparence greater than 40% and a surface resistivity of at most 10^7 ohms per square, said laminate comprising a substrate layer of a substantially transparent organic, polymeric material, a coupling layer of crosslinked acrylic, polymeric material bonded to one surface of said substrate layer, and a vaporized metal layer bonded to the coupling polymer layer; the optical transparence of said laminate and of any of its component layers being measured with respect to incident light having a wavelength of 550mμ, perpendicular to the surface of said laminate or component layer.

4,109,053

SIZING PAPER WITH STABLE DISPERSIONS OF HYDROCARBON RESINS

Paul Harwood Aldrich, Greenville, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 413,065, Nov. 5, 1973, Pat. No. 3,941,736.
This application Dec. 15, 1975, Ser. No. 640,821
Int. Cl.[2] D21D *3/00*
U.S. Cl. 428—413 **7 Claims**

1. In the method of sizing paper wherein a hydrocarbon resin is applied to paper fibers in the process of preparing sized paper, the improvement wherein there is employed in the sizing of the paper an essentially stable aqueous hydrocarbon resin dispersion consisting essentially of, by weight, from about 5.5 parts to about 50 parts solids and from about 94.5 parts to about 50 parts water; the solids content consisting essentially of, by weight, (a) from about 5 parts to about 45 parts hydrocarbon resin particles and (b) from about 0.5 part to about 10 parts of a water-soluble cation polymeric dispersing agent, component (a) being a hydrocarbon resin from ethylenically unsaturated hydrocarbon monomers having a ring and ball softening point of from about 45° C. to about 150° C., a molecular weight of from about 350 to about 2000, and an acid number of less than about 1, component (b) being selected from the group consisting of (i) a water-soluble polyaminopolyamide--epichlorohydrin resin, (ii) a water-soluble alkylenepolyamine--epichlorohydrin resin and (iii) a water-soluble poly(diallylamine)--epichlorohydrin resin.

4,109,054

COMPOSITES OF GLASS-CERAMIC-TO-METAL, SEALS AND METHOD OF MAKING SAME

Stephan J. Burgyan, Lakewood, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed May 19, 1976, Ser. No. 688,018
Int. Cl.[2] B32B *17/06, 15/04*
U.S. Cl. 428—433 **4 Claims**

1. In a composite comprising one glass component bonded to at least one copper-base alloy component comprising 2 to 12% aluminum and the balance essentially copper, said alloy component, just prior to bonding said glass component thereto, having had an Al_2O_3 containing oxide film on the bonding surface thereof, the improvement consisting essentially of the glass component having the following composition:

B_2O_3	2 to 5 Wt. %
PbO	85 to 90 Wt. %
F_2	2 to 8 Wt. %
SiO_2	3 to 7 Wt. %

the foregoing components totalling 100 Wt. % as they vary within their indicated ranges.

4,109,055

LAMINATED WINDSHIELD WITH IMPROVED INNERLAYER

Joseph Cherenko, Valencia, and Charles W. Lewis, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 682,538, May 3, 1976, Pat. No. 4,039,720.
This application May 4, 1977, Ser. No. 793,674
Int. Cl.[2] B32B *17/10, 27/42;* C08J *3/28*
U.S. Cl. 428—437 **15 Claims**

1. A method for making a safety glass laminate comprising the steps of:

a. preparing a transparent film of a thermoplastic polyvinyl acetal polymer which comprises a photoinitiator in an amount effective to initiate crosslinking of said film;

b. laminating said film to a transparent ply of a material selected from the group consisting of glass and rigid transparent plastics; and

c. irradiating the exposed surface of the film with actinic radiation to effect crosslinking of the exposed surface thereby improving its resistance to abrasion in the presence of organic solvents.

9. A transparent polymer film for use as an innerlayer in a bilayer safety glass laminate consisting essentially of a thermoplastic polyvinyl butyral polymer and an effective amount of photoinitiator which upon actinic irradiation is capable of initiating crosslinking of said film, especially at an exposed surface thereof.

4,109,056

STARCH/LATEX CAST COATINGS FOR PAPER

Gerald Craig, Hamilton; Wilbur G. Evans, Oxford, and Everett L. Potts, Jr., Hamilton, all of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 574,718, May 5, 1976, abandoned. This application Jan. 26, 1977, Ser. No. 762,522
Int. Cl.[2] B32B *23/08, 27/10;* C08L *3/02*
U.S. Cl. 428—512 **13 Claims**

1. A non-proteinaceous binder for cast surface coating of paper which comprises an aqueous admixture of acid hydrolyzed hydroxyethyl ether corn starch; a first styrene-butadiene polymer latex having a particle size of from about 800 to about 1300 angstroms, said first latex being characterized by a solids

content of between about 45.0 and about 47.0%, a maximum 200 mesh residue of about 0.075 grms/900 mls., a pH of about 3.8 to about 4.8, a maximum Brookfield viscosity of about 100 cps. and a surface tension of about 43.0 to about 49.0; and a second styrene-butadiene polymer latex having a particle size of from about 1350 to about 1650 angstroms, said second latex being characterized by a solids content of between about 47.0 and about 49.0%, a maximum 200 mesh residue of about 0.05 gms./900 mls, a pH of between about 5.5 and about 6.5, a maximum Brookfield viscosity of about 300 cps., and a surface tension of from about 49.0 to about 55.0; said starch and said first and second latices being adjusted in relative proportions of about 1:2:2 dry weight of said composition such that said composition has a pH of between about 9.5 and about 10, and a solids content of about 55 to about 60%.

12. Paper cast surface coated with said binder of claim 1.

4,109,057

METHOD FOR ACCELERATED CURING OF PHENOLIC RESIN ADHESIVES

Nobutaka Nakamura; Yukio Saeki, and Shigeru Nemoto, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed May 23, 1977, Ser. No. 799,639
Claims priority, application Japan, May 24, 1976, 51-59072
Int. Cl.[2] B32B *21/08;* **C08L** *5/00*
U.S. Cl. 428—528 **9 Claims**

1. A method for accelerated curing of a phenolic resin adhesive comprises adding powdered green tea to a thermosetting phenolic resin at about ambient temperature and curing said thermosetting resin by heating.

8. An adhesive composition prepared according to the method of claim 1.

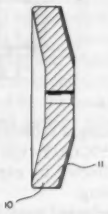
9. A plywood article which is bonded with the adhesive composition of claim 8.

4,109,058

X-RAY TUBE ANODE WITH ALLOYED SURFACE AND METHOD OF MAKING THE SAME

William D. Love, Waukesha, and Robert E. Hueschen, Hales Corners, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed May 3, 1976, Ser. No. 682,509
Int. Cl.[2] B22F *3/00*
U.S. Cl. 428—553 **13 Claims**



1. An anode for a rotating anode x-ray tube which anode has an exposed area on which an electron beam may impinge to cause production of x-radiation, said anode comprising:
- a body comprised of refractory metal, and
- a surface layer alloy on said body constituting said exposed area for said electron beam to impinge directly thereon, said layer composed of a ternary alloy wherein fine tungsten and molybdenum particles are both completely coated with rhenium to provide a true and homogeneous alloy.

7. An anode for a rotating anode x-ray tube which has a sufficiently high power rating to enable use of said tube for general x-ray diagnostic purposes, said anode having an exposed area on which an electron beam may impinge to cause production of x-radiation, said anode comprising:
- a body comprised of refractory material,
- a surface layer on said body constituting said exposed area for said electron beam to impinge directly thereon, said surface layer being composed of a ternary alloy of tungsten, rhenium and molybdenum, said ternary alloy being formed in a process including completely coating fine tungsten and molybdenum particles with rhenium derived from a solution containing a rhenium compound, said anode being made by the method comprising:
- mixing powdered molybdenum and perrhenic acid where the acid is in sufficient amount to provide enough rhenium for completely coating the particles of said powder with rhenium when said acid is reduced to rhenium,
- adding to said mixture powdered tungsten and then adding more perrhenic acid in an amount to provide sufficient rhenium for the amount of rhenium that is desired in the final mixture so that said mixture will have the amounts of tungsten, rhenium and molybdenum desired in an electron impingement surface layer of said anode,
- after neutralizing the perrhenic acid, applying sufficient heat to dry the powder mixture, then reducing the rhenium to pure metal which is in intimate contact with the other refractory metal powders, by heating said powder mixture to a temperature in the range from 800° C to 1200° C in a hydrogen atmosphere,
- pressing said dried mixture as a surface layer with additional powdered refractory metal constituting the body of said anode,
- subjecting the composite of said surface layer and said body to intense pressure,
- heating said composite to a temperature in the range from 2300° C to 2500° C to obtain a solid solution alloy in the surface layer and to densify the entire sintered body, and
- hot forging said composite at temperatures in the range of 1300° C to 1700° C to achieve further densification of said composite.

9. An anode for a rotating anode x-ray tube which has a sufficiently high power rating to enable use of said tube for general x-ray diagnostic purposes, said anode having an exposed area on which an electron beam may impinge to cause production of x-radiation, said anode comprising:
- a body comprised of refractory material,
- a surface layer on said body constituting said exposed area for said electron beam to impinge directly thereon, said surface layer being composed of a ternary alloy of tungsten, rhenium and molybdenum, said ternary alloy being formed in a process including completely coating fine tungsten and molybdenum particles with rhenium derived from a solution containing a rhenium compound, pressing a layer of said coated particles to a layer of metal particles, which comprise said body, subjecting the composite of said layer and said body to high temperature to convert said layer to a solid solution alloy, and hot forging said composite to densify it.

4,109,059

FLUX-CORED WIRE FOR ELECTRIC ARC WELDING

Robert De Haeck, St. Pieters-Kapelle, Belgium, assignor to La Soudure Electrique Autogene, Procedes Arcos, Anderlecht, Belgium

Continuation of Ser. No. 587,554, Jun. 17, 1975, Pat. No. 4,106,399. This application Feb. 23, 1977, Ser. No. 771,333
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] B23K *35/22*
U.S. Cl. 428—558 **10 Claims**

1. Flux-cored wire for automatic or semi-automatic electric arc welding of low-carbon or low-alloy steel as obtained by using the following manufacturing process comprising the following successive steps:

(1) Preparing a powder mixture of a composition falling within the following weight limits:

46 to 84% of iron powder (zero alloy to maximum 10% alloy);

4 to 8% of refined ferromanganese having from 80 through 85% of its composition manganese;

2 to 8% of powder of the class consisting of ferrosilicon alone, having 45% silicon, and as another category within the class a chemical consisting of calcium silicon, CaSi, up to 7% of the total powder mixture, and also optionally ferrosilicon, FeSi, with the calcium silicon, CaSi, to make the rest of the particular amount within the above range of 2 to 8%;

10 to 20% of powder of the class consisting of calcium fluoride, CaF_2, alone, and as another category within the class a chemical consisting of sodium fluoride, NaF, up to 10% of the total powder mixture and also optionally calcium fluoride, CaF, with the sodium fluoride, NaF, to make the rest of the particular amount within the above range of 10 to 20%;

0 to 6% of powder of the class consisting of calcium carbonate, $CaCO_3$, alone, and as other categories within the class a chemical which consists of another alkaline earth carbonate up to 5% of the total powder mixture, and a chemical which consists of magnesium oxide, MgO, up to 5% of the total powder mixture, with in each of these latter cases also optionally calcium carbonate, $CaCO_3$, to make the rest of the particular amount within the above range of 0 to 6%;

0 to 2% of powder of the class consisting of SiO_2, Al_2O_3, potassium feldspar and mixtures of SiO_2 and one of the other two;

0 to 2% of potassium titanate;

(2) Mixing the foregoing mixture with 1 to 3% of silicate in powder form;

(3) Baking the resultant product at 570° C to 620° C for from 105 through 150 minutes;

(4) Introducing the resultant product within a sheath of low-carbon (from 0.03% carbon through 0.09% carbon) or low-alloy (from 0.1% of alloying metal through 10% alloying metal) steel, in the proportion of from 30 through 60 grams of the product for each 100 grams of the sheath.

4,109,060

POROUS ELECTRODE FOR A CHEMO-ELECTRIC CELL AND A METHOD OF PREPARING THE SAME

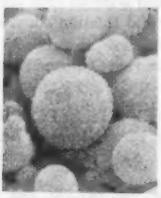
Bo Eric Christer Andersson, Tåby; Lars Ivar Carlsson, and Rolf Christer Roland Johnsson, both of Åkersberga, all of Sweden, assignors to Svenska Utvecklingsaktiebolaget (SU) Swedish National Development Co., Stockholm, Sweden

Filed Dec. 3, 1976, Ser. No. 747,317

Claims priority, application Sweden, Dec. 8, 1975, 7513813

Int. Cl.[2] B27F *3/00*

U.S. Cl. 425—566 **59 Claims**



1. A porous electrode for a chemo-electric cell comprising reduced and sintered particles of an active electrode material wherein the particles of the active electrode material are sintered together to porous grains, which in turn are sintered together to a porous, coherent electrode body having a structure that is built up with inelastically deformed contact areas between the grains and with a well defined ratio between the average size of the pores within the electrode body and the average size of the pores within the grains, which ratio is above 1:1.

9. In a method of preparing a porous electrode for a chemo-electric cell comprising reduced and sintered together particles of an active electrode material, by starting from particles of a reducible compound and heating the same in a reducing atmosphere for reduction thereof and pressing and sintering the reduced compound into a coherent electrode body, the improvement which comprises forming from the particles, before the heating in a reducing atmosphere, porous grains having a relatively homogeneous size, heating the grains in a reducing atmosphere at the sintering temperature of the electrode material, whereby the particles within each grain sinter together, and pressing and sintering the reduced grains so that they will sinter together to a porous, coherent electrode body having inelastically deformed contact areas between the grains and a ratio between the average size of the pores within the electrode body and the average size of the pores within the grains above 1:1.

4,109,061

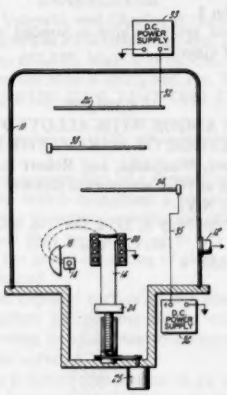
METHOD FOR ALTERING THE COMPOSITION AND STRUCTURE OF ALUMINUM BEARING OVERLAY ALLOY COATINGS DURING DEPOSITION FROM METALLIC VAPOR

Harry A. Beale, Jupiter, Fla.; Thomas E. Strangman, Manchester, and Edward W. Taylor, Richland, Wash., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 8, 1977, Ser. No. 858,912

Int. Cl.[2] B32B *15/00*; C23C *15/00*

U.S. Cl. 428—678 **21 Claims**



6. A method for coating a substrate with an oxidation and thermal crack resistant MCrAlY-type overlay coating wherein coating deposition is effected by exposing the substrate to a metallic vapor, comprising:

(a) initially for a preselected time, biasing the substrate at a small negative potential of about −10 volts to about −80 volts relative to ground while a portion of the vapor is ionized to deposit a compositonally and structurally modified layer being characterized by the MCrAlY composition being sufficiently depleted in aluminum to render the layer ductile as compared to an MCrAlY layer of normal composition and by freedom from harmful leader defects; and

(b) terminating biasing of the substrate for the remainder of deposition to deposit an oxidation resistant MCrAlY coating layer of normal composition on said first modified layer, said first layer serving as a preferred secondary substrate during subsequent deposition to reduce the number and severity of leader defects in the oxidation resistant

layer deposited thereon and as a ductile barrier layer during subsequent high temperature service to inhibit thermal crack propagation to the substrate.

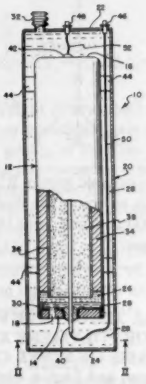
7. A coated substrate produced by the method of claim 6.

4,109,062

SUBMERSIBLE BATTERY APPARATUS

Joseph F. McCartney, Solana Beach, and Charles R. Gundersen, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 22, 1977, Ser. No. 835,766
Int. Cl.[2] H01M *14/00*
U.S. Cl. 429—6 15 Claims



1. A submersible battery apparatus with improved current flow rate comprising:

a battery having top and bottom casing ends, one of the battery casing ends having an aperture,

a pressure compensated housing having top and bottom ends;

said battery being mounted in the housing with the aperture in the battery casing end directed downwardly within and facing the bottom end of the housing;

said battery containing a liquid electrolyte; and

said housing containing a liquid which has a higher specific gravity than the electrolyte and is non-reactive therewith;

whereby gases generated by the battery are retained within the battery casing and battery power is increased with increased submergence.

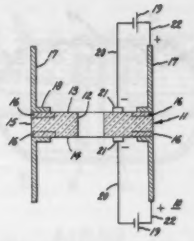
4,109,063

COMPOSITE BODY

Bruce S. Dunn, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 17, 1977, Ser. No. 807,406
Int. Cl.[2] H01M *2/02*
U.S. Cl. 429—30 8 Claims

1. A composite body comprising a substrate with opposite major surfaces, the substrate comprising a solid ion-conductive electrolyte material region and at least a portion of at least one major surface of a solid ion-insulating material region, and a moderately deformable metallic element bonded directly to the ion-insulating material of the substrate, the metal of the metallic element different from the metal of the mobile ions of the solid metallic ion-conductive electrolyte material region.

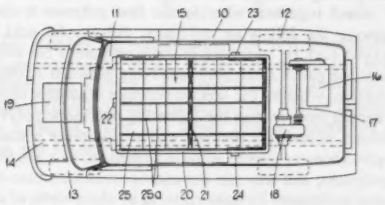


4,109,064

BATTERY PACKS

Peter Stuart Warner, Henlow, and John Richard Bicht, Hemel Hempstead, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Apr. 29, 1977, Ser. No. 792,169
Claims priority, application United Kingdom, May 8, 1976, 19032/76
Int. Cl.[2] H01M *2/10*
U.S. Cl. 429—66 2 Claims



1. A battery pack comprising a plurality of batteries, a structure in which the batteries are mounted, said structure including at least one wall generally parallel to planes of the plates of the batteries respectively, spring devices mounted between the batteries and said wall of the structure to exert a force in the direction transverse to the planes of the plates of the batteries, each spring device comprising a base plate and a number of blade spring elements mounted thereon, the blade spring elements being arranged in rows at opposite sides of the base plate alternately.

4,109,065

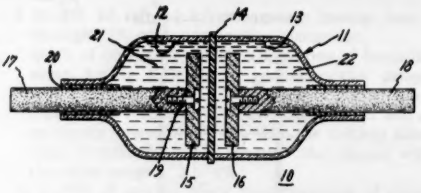
RECHARGEABLE AQUEOUS ZINC-HALOGEN CELL

Fritz G. Will, Scotia, and Fay W. Secor, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,409
Int. Cl.[2] H01M *10/24*
U.S. Cl. 429—105 4 Claims

1. A rechargeable aqueous zinc-halogen cell comprising a casing, an ion exchange membrane in the casing defining a positive and negative electrode compartment, an electrode substrate in each compartment, at least the electrode substrate

in the positive compartment consisting of vitreous carbon, and an aqueous electrolytic solution containing a zinc salt selected



from the class consisting of zinc bromide, zinc iodide and mixtures thereof in both compartments.

4,109,066

POLYACRYLIC ACID MEMBRANES FOR ELECTROCHEMICAL USE

Richard Dick, Paris; Georges Feuillade, Arpajon; Robert Gedessaud, Massy Palaiseau, and Louis Nicolas, Neuilly sur Seine, all of France, assignors to Compagnie Generale d'Electricite and Institut National de Recherche Chimique Appliquee Ircha, both of Paris, France

Filed Dec. 14, 1977, Ser. No. 860,649

Claims priority, application France, Dec. 14, 1976, 76 37573

Int. Cl.[2] H01M *10/04, 2/16*

U.S. Cl. 429—145 **18 Claims**

1. Semi-permeable membrane having a microporous structure comprising a first polymer and a second polymer intimately mixed together, wherein the first polymer is chosen from among the following polymers: polyacrylic acid, and methacrylic acid, or a mixture of these polymers; the average molecular weight of these polymers lying between 10,000 and a few million; wherein the second polymer is soluble in water and is chosen from among the following polymers: polyvinylpyrrolidone, polyvinylic alcohol, and a copolymer containing vinylpyrrolidone or vinylic alcohol sequences, or a mixture of these polymers; and wherein the microporous structure of the membrane is obtained by immersion, in an electrolyte, of a film whose composition by weight is as follows:

20 to 70% of the first polymer;

20 to 70% of the second polymer;

0 to 40% of a plasticizer of the preceding polymers, chosen from among the following substances: N-methylpyrrolidone, glycerol sulfolane, and hexamethylphosphoramide; and

0 to 20% of an organic or inorganic basic compound.

4,109,067

POLYMER COMPOSITIONS EVOLVING REDUCED AMOUNTS OF NOXIOUS GASES ON COMBUSTION

Gary L. Deets, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 22, 1977, Ser. No. 817,942

Int. Cl.[2] C08K *5/16*

U.S. Cl. 526—4 **3 Claims**

1. A polymer composition comprising a styrene/acrylonitrile copolymer and a diene rubber substrate with styrene and acrylonitrile grafted thereon which on thermal decomposition generates hydrogen cyanide, which composition comprises from 1 to 10 percent by weight of an organometallic complex comprising EDTA and a metal having an atomic number between 24 and 30, the percentage being based on the polymer composition.

4,109,068

RADIATION SENSITIVE VINYL HYDROPHILIC COPOLYMERS

John Graham Allen, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

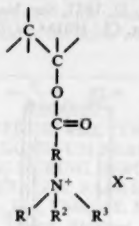
Continuation of Ser. No. 518,892, Oct. 29, 1974, abandoned, which is a continuation of Ser. No. 259,607, Jun. 5, 1972, abandoned. This application Sep. 7, 1976, Ser. No. 720,799

Claims priority, application United Kingdom, Jun. 9, 1971, 19668/71

Int. Cl.[2] C08L *23/00, 25/00*

U.S. Cl. 526—9 **11 Claims**

1. A polymeric composition comprising a copolymer containing (a) vinyl alcohol units and (b) units derived from a vinyl ester of structure



where R is a divalent organic group, R^1, R^2 and R^3 are organic substituents and X^- is an anion, the molar ratio of units (a):(b) being 1 to 100 to 1000 to 1 and units (a) and (b) form at least 80% of the copolymer.

4,109,069

HORIZONTAL AUTOCLAVE FOR THE BULK PREPARATION OF POLYMERS AND COPOLYMERS ON A BASIS OF VINYL CHLORIDE

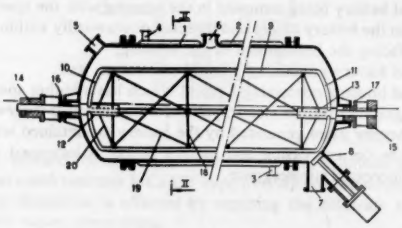
Michel Azemar, Irigny, and Lucien Viglecca, Caluire, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Division of Ser. No. 634,834, Nov. 24, 1975. This application Mar. 11, 1977, Ser. No. 776,587

Claims priority, application France, Dec. 4, 1974, 74 39613

Int. Cl.[2] C08F *2/02, 114/06*

U.S. Cl. 526—65 **3 Claims**



1. A method for the bulk preparation of polymers and copolymers on a basis of vinyl chloride in two steps, carried out in separate apparatuses, according to which there is effected, in a first step known as prepolymerization step, a limited polymerization with high turbulence agitation until a conversion factor of the monomer or monomers of the order of 7% to 15% is obtained, and then in a second step a final polymerization operation with slow stirring speed sufficient to insure a good thermostatic control of the reaction medium until the end of the polymerization or copolymerization reaction, said method being characterized by the fact that the final polymerization operation is effected in the autoclave equipped with a stirrer system of the frame type having one or more coaxial frames

mounted for rotational movement about a horizontal axis eccentrically spaced downwardly from the axis of the autoclave whereby the blades of the frame pass in close proximity to the bottom wall of the autoclave and remote from the top wall of the autoclave in which the ratio of the diameter of the cylinder generated by the frames to the diameter of the autoclave is within the range of 0.5 to 0.95.

4,109,070

METHOD OF PRODUCING OPTICALLY CLEAR HYDROPHILIC COPOLYMERS AND CONTACT LENSES

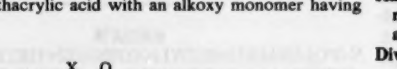
Samuel Loshaek, and Chah M. Shen, both of Chicago, Ill., assignors to Wesley-Jessen Inc., Chicago, Ill.

Filed Jun. 7, 1977, Ser. No. 804,260

Int. Cl.[2] C08F *220/20;* **C08L** *31/02;* **C02B** *3/00*

U.S. Cl. 526—77 **15 Claims**

1. In the process of making optically clear hydrophilic copolymers formed by copolymerizing a glycol monoester of acrylic or methacrylic acid with an alkoxy monomer having the formula:



wherein R is a C_1–C_4 straight or branched chain alkoxy group, R′ is a C_2 or C_3 straight or branched chain alkylene group, X is hydrogen or a methyl group, *m* is either 1 or 0, and *n* is an integer from 1 to 20, the improvement comprising distilling at least said alkoxy monomer under high vacuum and low temperature prior to copolymerization, promptly adding to said distilled monomer an amount of polymerization inhibitor below that which would inhibit copolymerization, but sufficient to provide a hydrated copolymer of high optical clarity, and then copolymerizing said monomer and said glycol monoester to form said hydrophilic copolymer.

4,109,071

PROCESS FOR THE POLYMERIZATION OF OLEFINS

Eugene Berger, Brussels, and Charles Bienfait, Keerbergen, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Apr. 9, 1976, Ser. No. 675,320

Claims priority, application Luxembourg, Apr. 14, 1975, 72278

Int. Cl.[2] C08F *4/02, 10/02*

U.S. Cl. 526—114 **24 Claims**

1. A process for the polymerization and copolymerization of alpha-olefins with comprises carrying out said polymerization or copolymerization in the presence of a catalyst system comprising:

(A) an organo-metallic compound of a metal of Groups Ia, IIa, IIb, IIIb, and IV of the Periodic Table; and

(B) a solid catalyst complex formed by reacting, with one another;

(1) at least one magnesium compound (M) having at least one organic radical-oxygen-magnesium or halogen-magnesium bond therein; with

(2) at least one titanium compound (T) having at least one organic radical-oxygen-titanium or halogen-titanium bond therein; with

(3) at least one zirconium compound (Z) having at least one organic radical-oxygen-zirconium or halogen-zirconium bond therein; and with

(4) at least one aluminum halide (A); said oxygen containing organic compounds of magnesium, titanium and zirconium contain at least one metal to oxygen to organic radical sequence and the organic radical contains from 1 to 20 carbon atoms; said halogen containing compounds of magnesium, titanium and zirconium contain at least one halogen to metal bond sequence; said compounds (M), (T), (Z) and (A) are used in amounts which satisfy the equation

$$\left(\frac{Zr}{Ti}\right)\cdot\left(\frac{X}{Mg+Zr+Ti}\right)>3$$

wherein Mg, Zr, Ti and X represent the amounts, in gram-equivalents, of magnesium, zirconium, titanium and halogen of said compounds.

4,109,072

ADDITION POLYMERS OF UNSATURATED IMIDAZOLINES

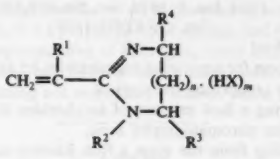
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 467,331, May 6, 1974, Pat. No. 4,006,247. This application Dec. 22, 1975, Ser. No. 643,729

Int. Cl.[2] C08F *26/06*

U.S. Cl. 526—258 **12 Claims**

1. A vinyl addition homopolymer of a monomer having the formula



wherein *n* and *m* are, individually, 0 or 1, X is an anion, R^1 is hydrogen, methyl or phenyl and R^2, R^3 and R^4 are, individually, hydrogen, alkyl (C_1–C_4), aryl (C_6–C_{10}), aralkyl (C_7–C_{11}) or alkaryl (C_7–C_{11}), being colorless and free of non-amidine imino carboxyl, ester and amide groups, unreacted nitrile groups and unreacted polyamine.

4,109,073

POLYMERIZATES OF OLEFINIC NITRILES CONTAINING INDENE

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

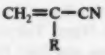
Filed Jun. 15, 1977, Ser. No. 806,847

Int. Cl.[2] C08F *32/08, 26/00, 4/30*

U.S. Cl. 526—280 **6 Claims**

1. The polymer composition resulting from the copolymerization in the presence of a free-radical initiator of

(A) from about 35 to 70% by weight of at least one nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) from about 10 to 50% by weight of a vinyl halide, and

(C) from about 5 to 20% by weight of indene,

wherein the given percentages of (A), (B) and (C) are based on the combined weight of (A) plus (B) plus (C).

4,109,074

PROCESS FOR PREPARING A HYDROPHILIC WATER INSOLUBLE POLYMER AND THE RESULTING POLYMER AND POLYMER ARTICLES

Charles P. Creighton, Alden, and Charles R. Teschemacher, Buffalo, both of N.Y., assignors to Alden Optical Laboratories, Inc., Alden, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,774
Int. Cl.[2] C08F *120/20*; G02C *7/02, 7/04*
U.S. Cl. 526—320 1 Claim

1. A contact lens or contact lens blank manufactured from a hydrophilic water insoluble water expandable acrylic polymer; said polymer being prepared by a process consisting essentially of heating a composition consisting essentially of ethylene glycol monomethacrylate; said composition being heated to a temperature of from about 100° to about 165° C for from about 30 to about 360 minutes and annealed at a temperature of about 135° C for about 2 hours, said composition being essentially free from polymerization catalysts and initiators and said composition containing less than about 0.05 weight percent ethylene glycol dimethacrylate.

4,109,075

SEPARATION OF SACCHARIDES BY EXCLUSION CHROMATOGRAPHY

Irving F. Deaton, LaGrange Park, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jun. 9, 1976, Ser. No. 694,258
Int. Cl.[2] C07H *1/06*
U.S. Cl. 536—1 5 Claims

1. A process for separating saccaharides by exculsion chromatography comprising the steps of

a. supplying a feed mixture of saccharides to a molecular exclusion chromatography zone,

b. collecting from the zone a first fraction containing the least diffusible saccharides of the mixture, said first fraction containing predominantly the highest molecular weight saccharides,

c. collecting subsequent fractions of saccharides from the zone, including a second fraction containing predominantly intermediate molecular weight saccharides and a third fraction containing predominantly lower molecular weight saccharides,

d. continuously eluting said zone, with the elution being carried out first with said first fraction and then with water, and

e. recovering the fractions from the zone.

4,109,076

5-IMINODAUNOMYCIN

David W. Henry, Chapel Hill, N.C., and George L. Tong, Cupertino, Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 8, 1977, Ser. No. 831,438
Int. Cl.[2] C07G *3/00, 11/00*
U.S. Cl. 536—4 2 Claims

1. 5-Iminodaunomycin and its pharmaceutically acceptable acid addition salts.

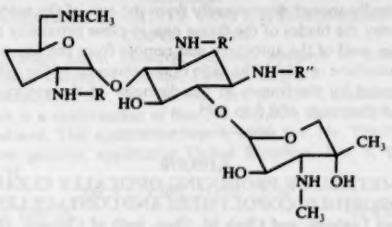
4,109,077

ANTIBIOTIC DERIVATIVES OF XK-62-2 COMPOUNDS

Kunikatsu Shirahata, Columbus, Ohio; Shinji Tomioka, Machida, Japan; Takashi Nara, Tokyo, Japan; Hideo Matsushima, Kawasaki, Japan, and Isao Matsubara, Machida, Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 531,768, Dec. 11, 1974, abandoned.
This application Jun. 3, 1976, Ser. No. 692,333
Claims priority, application Japan, Dec. 12, 1973, 48-137827
Int. Cl.[2] C07H *15/24*
U.S. Cl. 536—17 5 Claims

1. A compound having the formula



wherein R is α-hydroxy-γ-aminobutyryl and R′ and R″ is hydrogen or α-hydroxy-γ-aminobutyryl and at least one of R′ and R″ is α-hydroxy-γ-aminobutyryl and the other is hydrogen or a nontoxic pharmaceutically acceptable acid addition salt thereof.

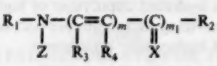
4,109,078

N-(POLYSACCHARIDYL)-NITROGEN HETEROCYCLES, ESPECIALLY PYRIMIDINE OR PURINE BASES, AND PROCESS FOR THEIR PREPARATION

Helmut Vorbrüggen, and Ulrich Niedballa, both of Berlin, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Mar. 26, 1976, Ser. No. 670,741
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2514275
Int. Cl.[2] C07H *19/06, 19/16*
U.S. Cl. 536—26 15 Claims

1. An N-(polysaccharidyl)-nucleoside of the formula



wherein Z is a polysaccharide moiety of a carbohydrate of at least 10 monosaccharide units and linked by a glycoside bond to the nitrogen atom, whose OH groups are free or blocked by alkanoyl, carbocyclic arylalkyl or carbocyclic aroyl, each of up to 10 carbon atoms;

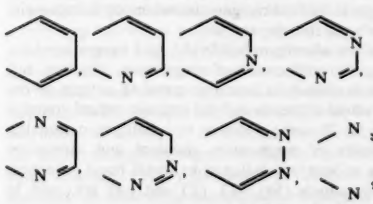
X is O or S;

m is 0 or 1;

m_1 is 0 or 1;

R_1 and R_2 collectively are saturated or unsaturated alkylene of 1–4 carbon atoms or a corresponding saturated or unsaturated alkylene wherein 1–2 carbon atoms in the chain are replaced by a nitrogen atom or a corresponding alkylene or aza-substituted alkylene substituted by 1 or 2 of lower alkyl, lower alkenyl carbocyclic aryl, carbocyclic aralkyl, carbocyclic aroyl or alkanoyl, alkoxy, carbocyclic acyloxy or alkanoyloxy, alkoxycarbonyl or dialkylaminocarbonyl, each of up to 10 carbon atoms, trifluoromethyl, hydroxy, oxo, carboxamido, amino, nitro, nitriloxo or halogen;

R_3 and R_4 each are hydrogen, alkyl of up to 6 carbon atoms, alkoxycarbonyl of up to 6 carbon atoms, alkylaminocarbonyl of up to 6 carbon atoms, carboxyl or nitrile or collectively are



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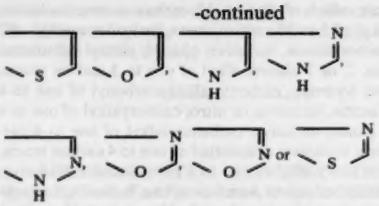


or a corresponding saturated divalent group or a corresponding divalent group substituted by lower alkyl, lower alkenyl, carbocyclic aryl carbocyclic aralkyl, carbocyclic aroyl, alkanoyl, alkoxy, carbocyclic aroyloxy, alkanoyloxy, alkoxycarbonyl or dialkylaminocarbonyl, each of up to 10 carbon atoms, trifluoromethyl, hydroxy, oxo, carboxamido, amino, nitro, nitriloxo or halogen.

4,109,079

STABILIZED S-ADENOSYL-L-METHIONINE PREPARATIONS

Toshihisa Kawahara; Goro Motoki; Kazuo Uchida, and Hiroshi Yoshino, all of Choshi, Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Japan

Filed Oct. 14, 1976, Ser. No. 732,287

Claims priority, application Japan, Oct. 16, 1975, 50-123775; Apr. 9, 1976, 57-39313

Int. Cl.[2] C07H *19/16*

U.S. Cl. 536—26 **12 Claims**

1. A stabilized dry S-adenosyl-L-methionine preparation which comprises S-adenosyl-L-methionine or a pharmaceutically acceptable salt thereof and an effective amount of a lithium salt which is pharmaceutically acceptable and is soluble in an acidic solution of the S-adenosyl-L-methionine or a pharmaceutically acceptable salt thereof and does not make the solution alkaline.

4,109,080

ION EXCHANGE COMPOUNDS ON CELLULOSE BASIS AND PROCESS FOR THE MANUFACTURE THEREOF

Karl Heinrich Lieser, Seeheim, and Peter Burba, Lampertheim, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Hannover, Fed. Rep. of Germany

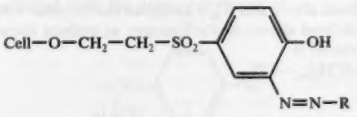
Filed Jun. 29, 1977, Ser. No. 810,963

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629542

Int. Cl.[2] C08B *11/00*

U.S. Cl. 536—43 **3 Claims**

1. Ion exchange compounds based on cellulose and having the formula



wherein R is a group forming chelate complexes with metal ions and Cell is the cellulose.

4,109,081

1-(3,5-DISUBSTITUTED-2,4,6-TRIIODOPHENYL)-3-(POLYHYDROXY-ALKYL)UREA COMPOUNDS

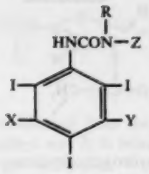
Kenneth R. Smith, Black Jack, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed May 15, 1975, Ser. No. 577,850

Int. Cl.[2] C07H *5/06*

U.S. Cl. 536—53 **9 Claims**

1. A compound of the formula:



wherein X and Y are each selected from the group consisting of lower alkoxy, hydroxy-(lower alkoxy), lower alkoxy-(lower alkoxy), lower acylamino, lower acylamino-(lower alkyl), lower acylamino-(lower acylamino), hydroxy-lower acylamino, N-(lower alkyl)-lower acylamino, N-hydroxy (lower alkyl) lower acylamino, N-(polyhydroxy lower alkyl) lower acylamino, lower alkylsulfonamido, N-(lower alkyl)-lower alkylsulfonamido, 3,3-bis-(lower alkyl)ureido, lower perfluoroacylamino, carbamyl, N-(lower alkyl) carbamyl, N-(hydroxy lower alkyl)carbamyl, N,N-di-(lower alkyl)carbamyl, N,N-di-(hydroxy lower alkyl)carbamyl, lower alkoxy-(lower acylamino), lower alkoxyalkoxy-(lower acylamino), hydroxy and hydroxy-lower alkyl and

is the monovalent residue of an aldosamine in which N is a nitrogen atom, Z is a polyhydroxylic residue, and R is selected from the group consisting of hydrogen, lower alkyl, hydroxy-lower alkyl and polyhydroxy-lower alkyl, said monovalent residue containing not more than 7 carbon atoms in its chain.

4,109,082

TRANS,TRANS-2,3,4,5-TETRADEHYDRO-PGI$_1$, COMPOUNDS

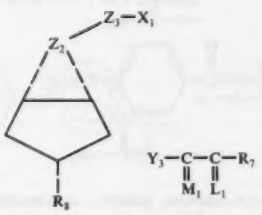
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 3, 1977, Ser. No. 821,541

Int. Cl.[2] C07D *307/93*

U.S. Cl. 542—426 **42 Claims**

1. A prostacyclin analog of the formula



wherein Z_3 is trans—CH=CH—,

wherein Y_3 is

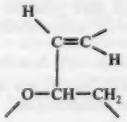
(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —CH_2CH_2—, or

(4) —C≡C—

wherein Z_2 is



(I)

or

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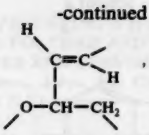
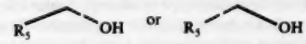
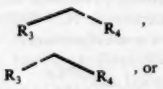


(2)

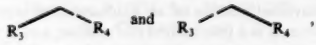
wherein R_h is hydrogen, hydroxy, or hydroxymethyl;
wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,
wherein L_1 is

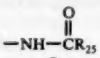


a mixture of

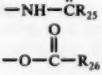


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein X_1 is

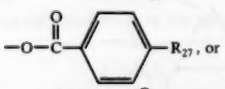
(1) —$COOR_1$ wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



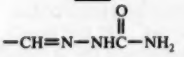
(a)



(b)

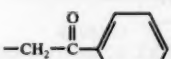


(c)



(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is methyl, phenyl, —NH_2, or methoxy; and R_{27} is hydrogen or acetamido; inclusive, phenacyl, i.e.,



phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;

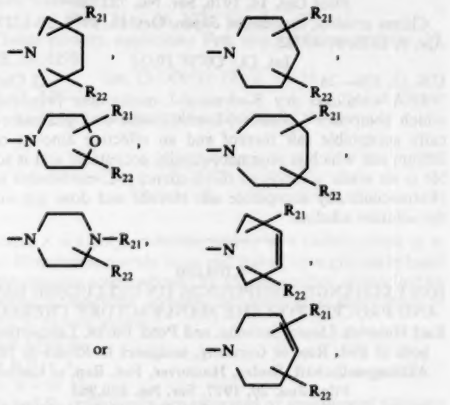
(2) —CH_2OH;

(3) —$CH_2NL_2L_3$ wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; or

(4) —COL_4, wherein L_4 is

(a) amino of the formula -$NR_{21}R_{22}$; wherein R_{21} and R_{22} are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro; carboxyalkyl of one to 4 carbon atoms, inclusive; carbamoylalkyl of one to 4 carbon atoms, inclusive; cyanoalkyl of one to 4 carbon atoms, inclusive; acetylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive or alkoxy of one to 3 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive; hydroxyalkyl of one to 4 carbon atoms, inclusive; dihydroxyalkyl of one to 4 carbon atoms; and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



wherein R_{21} and R_{22} are as defined above;

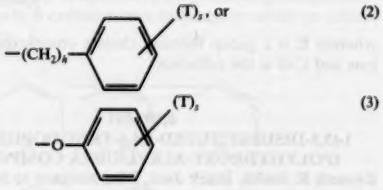
(c) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(d) sulphonylamino of the formula —$NR_{23}SO_2R_{21}$, wherein R_{21} and R_{22} are as defined above; or

(e) hydrazino of the formula —$NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula —$NR_{21}R_{22}$, as defined above, or cycloamino, as defined above.

wherein R_7 is

(1) —$(CH_2)_m$—CH_3,



(2)

(3)

wherein *m* is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with

the proviso that no more than two T's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when X_1 is $—CH_2NL_2L_3$.

4,109,083

4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

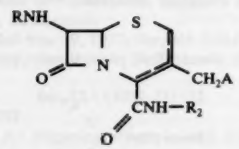
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 658,292, Feb. 17, 1976, Pat. No. 4,039,532, which is a division of Ser. No. 508,634, Sep. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Apr. 27, 1977, Ser. No. 791,214

Int. Cl.[2] C07D *501/36*

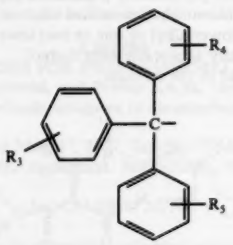
U.S. Cl. 544—26 6 Claims

1. A compound selected from the group consisting of



wherein

R is selected from the group consisting of 2,2,2-trichloroethoxycarbonyl, 2,2,2-tribromoethoxycarbonyl, benzyloxycarbonyl and

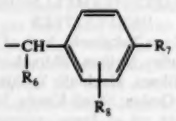


wherein

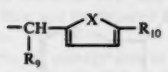
R_3, R_4 and R_5 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl, methoxy and phenyl;

A is selected from the group consisting of 1-methyl-5-tetrazolylthio and 2-methyl-1,3,4-thiadiazolyl-5-thio; and

R_2 is selected from the group consisting of



R_2 is selected from the group consisting of



wherein

R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,109,084

THIOOXIME CEPHALOSPORIN DERIVATIVES

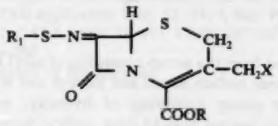
Eric M. Gordon, West Trenton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 8, 1976, Ser. No. 748,425

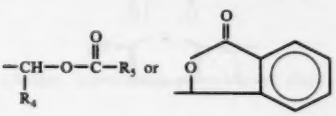
Int. Cl.[2] C07D *501/26, 501/48*

U.S. Cl. 544—29 12 Claims

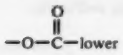
1. A compound of the formula:



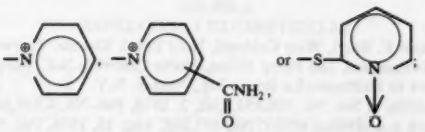
wherein R is hydrogen, lower alkyl of 1 to 4 carbons, benzyl, p-methoxybenzyl, p-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, tri(lower alkyl) silyl, lower alkoxymethyl,



X is hydrogen,



alkyl wherein alkyl is of 1 to 4 carbons,



R_1 is lower alkyl of 1 to 4 carbons, phenyl, or phenyl having a halo, lower alkyl of 1 to 4 carbons, or lower alkoxy of 1 to 4 carbons substituent; R_4 is hydrogen or lower alkyl of 1 to 4 carbons; and R_5 is lower alkyl of 1 to 4 carbons.

4,109,085

7-AMINO-3-SUBSTITUTED-CEPHEM COMPOUNDS

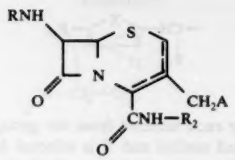
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 658,292, Feb. 17, 1976, Pat. No. 4,039,532, which is a division of Ser. No. 508,634, Sep. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Apr. 27, 1977, Ser. No. 791,215

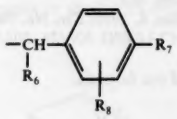
Int. Cl.[2] C07D *501/16*

U.S. Cl. 544—30 2 Claims

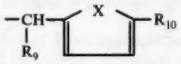
1. A compound selected from the group consisting of



wherein
R is hydrogen
A is hydrogen and
R_2 is selected from the group consisting of



wherein
R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



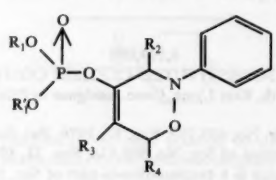
wherein
R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,109,086
3,6-DIHYDRO-2H-1,2-OXAZINES

Kaspar F. Burri, West Caldwell, N.J.; Frank Kienzle, Therwill, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.Y.

Division of Ser. No. 618,853, Oct. 2, 1975, Pat. No. 4,025,584, which is a division of Ser. No. 497,598, Aug. 15, 1974, Pat. No. 3,933,948. This application Feb. 7, 1977, Ser. No. 766,301
Int. Cl.[2] C07D *265/02*
U.S. Cl. 544—63 **4 Claims**

1. A compound of the formula



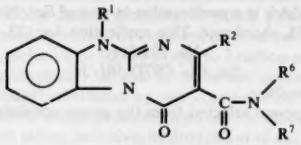
wherein each of R_1 and R_1' is lower alkyl, phenyl, phenyl substituted by one or more lower alkyl, fluoro, chloro, bromo, nitro and lower alkoxy groups or benzyl and each of R_2, R_3 and R_4 is hydrogen or lower alkyl.

4,109,087
1,4- AND 4,10-DIHYDRO-4-OXO-PYRIMIDO[1,2-A]BENZIMIDAZOLE-3-CARBOXYLIC ACID AMIDES

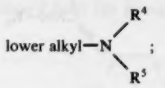
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 696,329, Jun. 15, 1976, Pat. No. 4,072,679. This application Dec. 12, 1977, Ser. No. 860,021
Int. Cl.[2] C07D *487/04*
U.S. Cl. 544—115 **12 Claims**

1. A compound of the formula

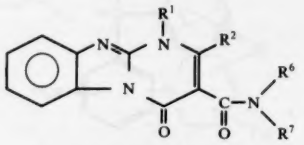


wherein
R^1 is hydrogen, lower alkyl, phenyl-lower alkyl or



R^2 is hydrogen or lower alkyl;
R^4 and R^5 each is lower alkyl;
R^6 and R^7 together with the nitrogen form an unsubstituted or substituted pyrrolidino, piperidino, piperazinyl, morpholino or thiamorpholino radical wherein the substituent is hydroxy-lower alkyl or one or two lower alkyl groups; and physiologically acceptable salts thereof.

2. A compound of the formula



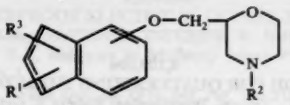
wherein R^1, R^2, R^6 and R^7 have the same meaning as in claim 1, and physiologically acceptable salts thereof.

4,109,088
2-(INDENYLOXYMETHYL) MORPHOLINE DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo; Yuji Kawashima, Kiyose; Tadao Kojima, Shiraoka; Kunihiro Niigata, Ageo; Takashi Fujikura, Hachioji; Yoshihisa Nozaki, Tokyo; Shiro Tachikawa, Omiya; Shinji Usuda, Matsudo, and Soichi Kagami, Kawaguchi, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 669,884, Mar. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 646,844, Jan. 5, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 772,320
Claims priority, application Japan, Jan. 29, 1975, 50-12177; Dec. 25, 1975, 50-155647
Int. Cl.[2] C07D *265/30*
U.S. Cl. 544—174 **13 Claims**

1. A 2-(indenyloxymethyl)morpholine compound of the formula:



wherein R^1 and R^3 each represents a hydrogen atom, a lower alkyl group or a phenyl group, R^2 is a hydrogen atom, a lower alkyl group, a cycloalkyl group having 5-6 carbon atoms, a phenyl group, or a benzyl group, one of the dotted lines representing a single bond and the other is a double bond and the non-toxic pharmaceutically acceptable acid addition salts thereof including tautomeric mixtures thereof.

4,109,089
METHOD OF PREPARING CYANURIC ACID

Mario G. R. T. de Cooker, Sittard, and Antonius J. M. Hermus, Eindhoven, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Sep. 19, 1977, Ser. No. 834,663

Claims priority, application Netherlands, Sep. 23, 1976, 7610557

Int. Cl.² C07D *251/32*

U.S. Cl. 544—192 **9 Claims**

1. A process for preparing cyanuric acid, comprising:

heating a solution of urea, biuret or a mixture of urea and biuret in a molten salt solvent comprising ammonium nitrate, wherein the concentration of urea and/or biuret is kept below 500 grams per kg of solution.

forming cyanuric acid and ammonia in said solution, and

reducing during the reaction the concentration of said ammonica in said solution.

4,109,090
A PROCESS FOR PREPARING MELAMINE

Rudolf van Hardeveld, and Petrus F.A.M. Hendriks, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Mar. 17, 1977, Ser. No. 778,743

Claims priority, application Netherlands, Mar. 26, 1976, 7603164

Int. Cl.² C07D *251/60*

U.S. Cl. 544—201 **17 Claims**

1. In a process for preparing melamine wherein molten urea is atomized and sprayed into at least one fluidized bed composed at least partly of catalytically active material contained in a reactor, by means of a two-phase sprayer using an atomizing gas selected from the group consisting of ammonia or a mixture of ammonia and carbon dioxide, in which reactor a temperature of between about 300° and 500° C and a pressure of between about 1 and 25 atmospheres are maintained, and wherein said sprayer is comprised of a liquid feed tube adapted for the supply of molten urea, terminating with a liquid outflow opening and positioned around the axis of the sprayer and coaxially within a gas feed tube adapted for the supply of atomizing gas and terminating with a sprayer outflow opening, said liquid and gas feed tubes being adapted such that said gas feed tube extends beyond the liquid outflow opening of said liquid feed tube, the improvement wherein, in said sprayer,

said gas feed tube near the sprayer outflow opening has an inner wall section that tapers narrower towards the sprayer outflow opening, at an angle α of between 70° and 90° with respect to the sprayer axis, and continues by way of a rounded shoulder into a comparatively short outflow channel ending at said sprayer outflow opening, said rounded shoulder having a radius of between 0.1 and 0.4 times the smallest diameter of said outflow channel,

said liquid feed tube has an outer wall, and an end face between said outer wall and liquid outflow opening chamfered at an angle α' of between 70° and 90° with respect to the sprayer axis thereby forming a conical channel with an average apex of between 140° and 180° between said chamfered end face and the tapered inner wall section of the gas feed tube,

and further wherein the passage area of the conical channel at the end adjacent to said outflow channel is no greater than such passage area at any other place within said conical channel, the smallest passage area of said outflow channel is no greater than the smallest passage area of said conical channel, and the smallest diameter of the outflow channel is between 1.0 and 1.6 times the diameter of the liquid outflow opening.

4,109,091
DERIVATIVES OF 1,4- AND 4,10-DIHYDRO-4-OXO-PYRIMIDO[1,2-a]BENZIMIDAZOLE-3-CARBOXYLIC ACID AMIDES

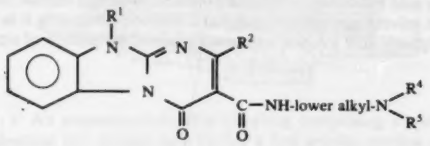
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 696,329, Jun. 15, 1976, Pat. No. 4,072,679. This application Dec. 12, 1977, Ser. No. 859,790

Int. Cl.² A61K *31/415*; C07D *487/04*

U.S. Cl. 544—250 **8 Claims**

1. A compound of the formula



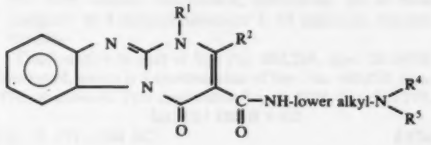
wherein

R^1 is hydrogen, lower alkyl, phenyl-lower alkyl or lower alkyl

R^2 is hydrogen or lower alkyl;

R^4 and R^5 each is lower alkyl; and physiologically acceptable salts thereof.

2. A compound of the formula



wherein R^1, R^2, R^4 and R^5 have the same meaning as in claim 1, and physiologically acceptable salts thereof.

4,109,092
PREPARATION OF 2-(PYRIDINYL)-4-PYRIMIDINAMINES

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,379

Int. Cl.² C07D *401/04*

U.S. Cl. 544—328 **8 Claims**

1. The process which comprises reacting PY-carboxamidine with α-chloroacrylonitrile in the presence of an acid-acceptor to produce 2-PY-4-pyrimidinamine where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents.

4,109,093

PROCESS FOR MAKING 2-(4'-AMINOPHENYL) 5-AMINO BENZIMIDAZOLE

Aimé Joseph Arsac, Condrieu, and Pierre Frank, Saint-Clair-Du-Rhone, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 7, 1976, Ser. No. 647,240

Claims priority, application France, Jan. 14, 1975, 75 00924; Nov. 18, 1975, 75 35129

Int. Cl.[2] C07D *235/18*

U.S. Cl. 548—334 **2 Claims**

1. A process for the preparation of 2-(4'-amino phenyl)-5-amino benzimidazole (DAPBI) wherein p.nitrobenzoic acid is condensed with aniline to obtain N-(4'nitrobenzoyl)-aniline, the N-(4'-nitrobenzoyl)-aniline is dinitrated at a temperature of between 0° and 25° C. in the presence of concentrated sulphuric acid and concentrated nitric acid to obtain N-(4'-nitrobenzoyl)-2,4-dinitroaniline, the N-(4'-nitrobenzoyl)-2,4-dinitroaniline is reduced to the corresponding triamine, and the deshydrocyclization of the triamine is carried out to obtain the DAPBI, wherein the improvement consists essentially of: treating p.nitrobenzoic acid with a halogenating agent in an inert aliphatic solvent medium to form the acid halide, and carrying out the condensation of the acid halide with aniline in the said inert aliphatic solvent medium with stoichiometric proportions of p.nitrobenzoic acid and aniline without isolating the acid halide; extracting the N-(4'-nitrobenzoyl)-aniline from the solvent medium with sulphuric acid and dinitrating it in its sulphuric acid solution with stoichiometric proportion of nitric acid without intermediate isolation of the N-(4'-nitrobenzoyl-)aniline.

4,109,094

METHOD FOR QUATERNIZING IMIDAZOLINES

Bhupendra C. Trivedi, Worthington; Robert A. Grimm, Columbus, and R. B. McConnell, Dublin, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jun. 27, 1977, Ser. No. 809,988

Int. Cl.[2] C07D *233/16*

U.S. Cl. 548—347 **4 Claims**

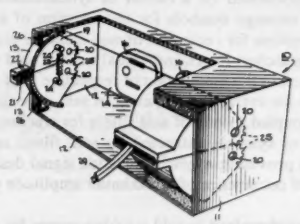
1. A process for quaternizing an imidazoline product provided by the cyclization of a diamidoamine obtained by condensing an ethylene-alkylene triamine and a higher fatty acid or functional equivalent thereof, which comprises the steps: (a) reacting said imidazoline product with a quaternizing agent selected from the group consisting of a lower alkyl halide, a lower dialkyl sulfate, benzyl chloride and benzyl bromide on a basis of about a mole of said agent per mole of the starting amidoamine condensate; (b) basifying the reaction mixture with an alkaline metal alkoxylate to the extent of neutralizing the protonated species formed in step (a); (c) reacting the basified mixture of step (b) with a number of equivalents of quaternizing agent about equal to that of base used in step (b); and sequentially repeating steps (b) and (c) until the non-quaternized content of the reaction mixture is less than about 3 weight percent.

4,109,095

WEATHERPROOF ELECTRICAL OUTLET BOX COVER

David A. Kling, Martinsville, and Charles W. Bell, Maplewood, both of N.J., assignors to Mulberry Metal Products, Inc., Union, N.J.

Filed Oct. 28, 1976, Ser. No. 736,578
Int. Cl.[2] H02G *3/18*
U.S. Cl. 174—67 10 Claims



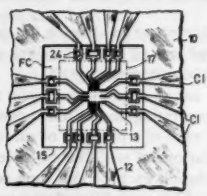
1. A weatherproof electrical outlet box cover comprising
a housing having side walls, defining an opening and a back wall for receiving at least one electrical outlet, said back wall being disposed in alignment with said opening;
a pair of lids pivotally mounted on said housing to close over said opening, each said lid having a recess at an edge thereof facing a recess in said other cover;
means for moving said lids between a closed position over said opening to an opened position to provide access to the interior of said housing and an electrical outlet therein; and
a pair of resilient sealing strips, each said sealing strip being disposed in a respective recess for abutting against the other of said sealing strips and for sealingly engaging about a cord of an electrical appliance plugged into the electrical outlet.

4,109,096

CONDITIONING SUPPORTS OF MICRO-PLATES OF INTEGRATED CIRCUITS

Gerard Dehaine, Chatillon sur Seine Bagneux, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris

Filed Jan. 27, 1976, Ser. No. 652,803
Claims priority, application France, Jan. 29, 1975, 75 02802
Int. Cl.[2] H05K *1/04;* H01L *23/48*
U.S. Cl. 174—68.5 13 Claims



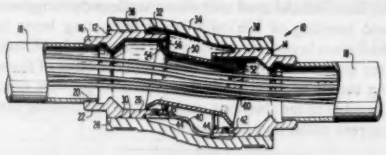
1. A support for integrated circuit chips to be mounted on an interconnecting base provided with conductive areas, said support comprising:
a flexible strip made of an inextensible insulating material having equidistant openings disposed along the axis thereof:
a plurality of sets of interface conductors carried by said strip, each set being associated with a respective opening, said conductors of each said sets being arranged, on one of the faces of the strip, in a pattern of fingers extending cantilever-wise towards the centre of a respective opening, said conductors being electrically independent from each other and each interface conductor comprising a portion attached to said strip and an overhanging portion having a contact region which is located at a distance from the edge of said respective opening and which is intended to be soldered to a corresponding conductive area on the interconnecting base, said overhanging portion including a main part of constant width which terminates, near the free inner end of said conductor, in a straight terminal part narrower than said main part, and an open-centred structure located between the contact region of said conductor and the portion of that conductor which is attached to said strip, said open-centred structure having sides with width of which is substantially equal to half the width of said main part.

4,109,097

EXPANSION-DEFLECTION COUPLING

Richard C. Berry, Camillus, N.Y., assignor to Crouse-Hinds Company, Syracuse, N.Y.

Filed Mar. 1, 1977, Ser. No. 773,369
Int. Cl.[2] H02G *15/08*
U.S. Cl. 174—86 6 Claims



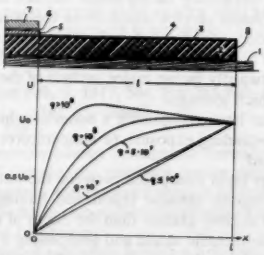
1. An expansion-deflection coupling comprising a pair of identical hub fittings each having a first annular portion of a predetermined internal diameter adapted to be secured to a conduit and a second annular portion having a larger internal diameter, a rigid tubular raceway having each end thereof moveably disposed within the second annular portion of a respective hub fitting, resilient flexible sleeve means secured to the outer surface of said second annular portion of each hub and extending between said hubs and grounding strap means secured to the end of said second annular portion of each hub and extending between said hubs.

4,109,098

HIGH VOLTAGE CABLE

Mats Gunnar Olsson, Stockholm; Carl Ove Tollerz, Bromma, and Sven Gunnar Wretemark, Stockholm, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation-in-part of Ser. No. 681,768, Apr. 29, 1976, abandoned, which is a continuation of Ser. No. 540,870, Jan. 14, 1975, abandoned. This application Sep. 1, 1976, Ser. No. 719,368
Int. Cl.[2] H01B *9/02*
U.S. Cl. 174—106 SC 6 Claims



1. A high voltage cable comprising:
an inner conductor, an inner semiconducting layer surrounding said conductor,

an insulation layer surrounding said inner semiconducting layer, an outer semiconducting layer surrounding said insulation layer, said outer semiconducting layer being strongly bonded to said insulation layer and having an electrical surface resistivity measured along the outer surface of the outer semiconducting layer and being within the range of 10^7 and 10^9 ohm/square and essentially voltage independent;

a further semiconducting layer surrounding said outer semiconducting layer in surface engagement therewith, said further semiconducting layer having an outer sheet resistivity of at most 10^6 ohm/square;

shielding means including metal wires encompassing said further semiconducting layer;

said cable further comprising an end for connection purposes at which said shielding means and said further semiconducting layer being removed to leave said inner conductor projecting therebeyond covered, in succession, by said inner semiconducting layer, said insulation layer and said outer semiconducting layer, and a semiconductor connection between said outer semiconducting layer and said inner conductor, the combination of said value of surface resistivity of said outer semiconducting layer and said bonding of the outer semiconducting layer to said insulation layer providing a voltage gradient between the free end of the inner conductor and the edge of the shielding means of sufficiently low value to prevent corona at the edge of the shielding means while minimizing creeping current paths and flash over.

4,109,099

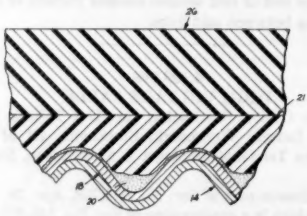
DUAL JACKETED CABLE

Matthew Raymond Dembiak, Clifton, N.J., and Wayne McCall Newton, Lilburn, Ga., assignors to Western Electric Company, Incorporated, New York, N.Y.

Continuation of Ser. No. 655,360, Feb. 5, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,716

Int. Cl.[2] H01B 7/28

U.S. Cl. 174—107 **6 Claims**



1. A cable, which comprises:

a core;

a corrugated metallic shield surrounding the core and having an outwardly facing major surface and an inwardly facing major surface which faces the core; and

an extruded covering of polymeric material which surrounds and is in intimate contact with at least portions of the outwardly facing major surface of the metallic shield, and which includes:

an outer layer comprising a material which is capable of withstanding exposure to temperatures of at least 212° F; and

an inner layer interposed between the outer layer and the corrugated metallic shield and having a thickness at least slightly greater than the depth of the corrugations of the metallic shield and comprising a material having a notch sensitivity which is substantially less than that of the material of the outer layer to maintain the structural integrity of the cable notwithstanding corrugation imprint of the inner layer by the metallic shield.

4,109,100

REVERBERATION COMPENSATING COMMUNICATION SYSTEM

Manfred G. Unkauf, Franklin, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 7, 1976, Ser. No. 720,913

Int. Cl.[2] H04L 27/24

U.S. Cl. 178—67 **5 Claims**

1. In a communication system wherein a sequence of code words is modulated on a carrier in synchronism with a sequence of message symbols for transmission of a message, a receiving system for reception of said message comprising:

a set of matched filters, individual ones of said filters being matched to the modulation of respective ones of said code words for extracting a symbol of said message;

means coupled to one of said filters for tracking the amplitudes of symbols extracted by said filter, said tracking means providing a synchronization signal designating the time of occurrence of a maximum amplitude of said symbols;

means synchronized to said tracking means for sequentially selecting symbols from each of said filters; and

means coupled to said selecting means and including a feedback loop for filtering a sequence of symbols to recover said message, said feedback loop including an integrator and a comparator, said comparator signaling the occurrence of a symbol when the magnitude of an output signal of said integrator exceeds a predetermined reference value.

4,109,101

CORRELATIVE CONVERTER BETWEEN A 2^n-ARY CODE SEQUENCE AND A 2^{n+1}-PHASE CARRIER PULSE SEQUENCE

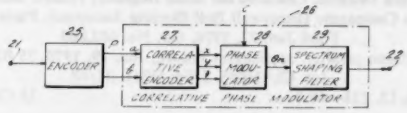
Toshihiko Mitani, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Jun. 2, 1976, Ser. No. 691,974

Claims priority, application Japan, Jun. 4, 1975, 50-67851

Int. Cl.[2] H04L 27/24

U.S. Cl. 178—67 **10 Claims**



1. A correlative phase modulator for converting a binary information signal into an eight phase psk signal, said correlative phase modulator comprising:

first encoder means responsive to said binary information signal for generating one of four possible quaternary signals during each of a plurality of successive time periods, the particular one of said four possible quaternary signals generated during each of said time periods being determined by said binary information signal;

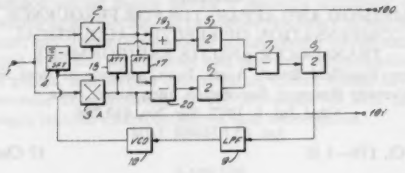
second encoder means responsive to said quaternary signals for generating one of eight possible octernary signals during each of said time periods, the particular one of said eight possible octernary signals generated during any given one of said time periods being determined by a predetermined law of correlation between the quaternary signals generated during two successive time periods, said second encoder means generating said octernary signals in such a manner that any of the eight possible octernary signals may be generated during each of said time periods;

eight phase modulator means responsive to said octernary signals for eight-phase modulating a carrier signal as a function of said octernary signals.

4,109,102
PHASE SYNCHRONIZING CIRCUIT

Yasuharu Yoshida, and Yoshimi Tagashira, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,910
Claims priority, application Japan, Dec. 2, 1975, 50-144265; Jan. 30, 1976, 51-9068; Apr. 8, 1976, 51-39742
Int. Cl.[2] H04L *7/00*
U.S. Cl. 178—69.1 11 Claims



8. A 2^n-phase PSK demodulator, n being a positive integer greater than or equal to 2, comprising:

(a) variable frequency generator means for generating 2^{n-1} phase comparison signals, the frequency and absolute phase of each of said phase comparison signals being determined by a phase error signal applied to said variable frequency generator means, the relative phase of each of said 2^{n-1} phase comparison signals being displaced from the remaining said phase comparison signals by $2K\,\pi/2^n$ radians, where K is an integer meeting the relationship $0<K<2^{n-1}$;

(b) 2^{n-1} phase detectors, each of said phase detectors for generating a demodulated output signal representative of a phase comparison between an incoming 2^n-phase PSK signal and a different one of said phase comparison signals;

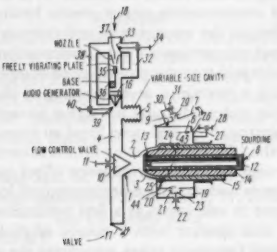
(c) 2^p-phase shifting means, p being $0 \leqq p \leqq n-1$, each of said phase shifting means for shifting the phase of the demodulated output signal generated by a respective one of said phase detectors by $\pi/2^{n+1}$ radians;

(d) means for synthesizing the outputs of said phase shifting means to generate said phase error signal.

4,109,103
SPEECH SIMULATOR

Nikolai Grigorievich Zagoruiko, Morskoi prospekt 21, kv. 28, and Alexandr Borisovich Kolmogorov, ulitsa Zorge 237, kv. 36, both of Novosibirsk, U.S.S.R.

Filed Apr. 14, 1976, Ser. No. 676,897
Claims priority, application U.S.S.R., Apr. 15, 1975, 2126341
Int. Cl.[2] G10L *1/10*
U.S. Cl. 179—1 SG 8 Claims



1. A speech simulator comprising:

interconnected first and second pipes;

a mouthpiece;

a sourdine which is movable within at least a portion of said mouthpiece;

a closed, variable-sized cavity,

said first pipe communicating with said mouthpiece,

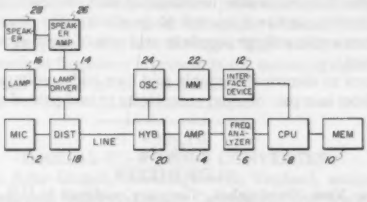
said second pipe being hermetically connected to said closed, variable-size cavity;

a main resonator having an outlet communicating with the atmosphere, and a lid arranged to selectively open and close said outlet, said main resonator being hermetically connected to said mouthpiece and receiving said sourdine, said first and second pipes and said mouthpiece and said main resonator together forming an air duct; and air supply means for supplying air to said air duct successively along the following general path: said second pipe, said first pipe, said mouthpiece and said main resonator.

4,109,104
VOCAL TIMING INDICATOR DEVICE FOR USE IN VOICE RECOGNITION

Toshihiko Toyoshima, Tokyo, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 22, 1976, Ser. No. 698,651
Claims priority, application Japan, Aug. 15, 1975, 50-099364
Int. Cl.[2] G10L *1/02*
U.S. Cl. 179—1 SD 5 Claims



1. In a voice recognition system which recognizes the vocal utterances spoken by an individual into a microphone by converting the voice utterances into electrical signals, said electrical signals being further converted into a plurality of characteristics which are compared by a data processing device to stored characteristics, the improvement comprising:

means responsive to a signal from said data processing device to provide a timing signal,

means responsive to said timing signal for signalling to said individual a time start when vocal utterances are to be made into said microphone, and

means responsive to said signalling means for generating a control signal for activating said data processing device at a time during which or slightly after a predetermined time period, the time start following which said vocal utterances are to be made and the time when said data processing device is activated being selected to reduce the standby time of said data processing device.

4,109,105
EARPHONE MOUNTING IN SAFETY HELMET FOR MOTORCYCLE RIDERS

Richard J. Von Statten, Jr., 211 Chicory La., Buffalo Grove, Ill. 60090

Filed Feb. 7, 1977, Ser. No. 765,927
Int. Cl.[2] H04B *1/38*
U.S. Cl. 179—1 VE 6 Claims

1. In a motorcycle having a magnetic cartridge playback device mounted thereto, the playback device producing two audio voltage signals, the playback device having an output receptacle to which the two audio voltage signals are coupled, the improvement comprising:

a cable, one end of said cable having a first plug for removable insertion into said output receptacle, the other end of said cable being bifurcated into two cable branches, the free ends of the branches being electrically coupled to two

second plugs, the first plug coupling said two audio voltage signals into said cable, each of the two second plugs being electrically coupled to one of said two audio voltage signals,

a motorcycle helmet, said helmet having a resilient rubber-like lining affixed to the interior portions thereof,

a pair of speakers, each of said pair of speakers fixedly secured within an opening in said lining,

a cloth-like screen, said screen fixedly secured to the exposed surface of said lining covering said opening,

a pair of input receptacles, said pair of input receptacles fixedly secured to said helmet, said pair of input receptacles for removable insertion of said two second plugs therein, said two second plugs electrically coupling the two audio voltage signals to said pair of input receptacles, and

means to electrically couple said two audio voltage signals from said pair of input receptacles to said pair of speakers.

4,109,106

AUDIOMETER

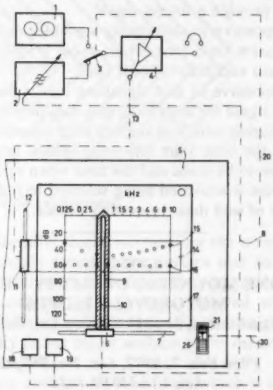
Rainer Voss, Oststeinbek, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,876

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615903

Int. Cl.² A61B *4/07*

U.S. Cl. 179—1 N **8 Claims**



1. An audiometer comprising, an audio-frequency tone generator whose frequency is variable in steps by means of a first slider which locks in different locking positions, an amplifier whose output signal is variable by means of a second slider which is movable perpendicularly to the direction of movement of the first slider, first and second marking templets connected to said first and second sliders, respectively, each marking templet extending substantially perpendicularly to the direction of movement of its respective slider and parallel to the direction of movement of the other slider, a speech source including a sound carrier, a switch for selectively connecting the output of the sound carrier or the audio-frequency tone generator to the input of the amplifier, and means coupled to the first slider comprising a number of locking strips corresponding to the number of tests to be performed with the audiometer so that for each test a selected strip is in an operating position in which it determines the various locking positions of the first slider.

4,109,107

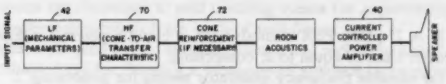
METHOD AND APPARATUS FOR FREQUENCY COMPENSATION OF ELECTRO-ACOUSTICAL TRANSDUCER AND ITS ENVIRONMENT

Warren Benefield Boast, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 5, 1977, Ser. No. 812,786

Int. Cl.² H04R *3/04*

U.S. Cl. 179—1 D **17 Claims**



1. A system for compensation for frequency dependent characteristics of an electro-acoustical transducer having a movable cone and associated mechanical response parameters and driven by current amplifier circuit means, comprising:

first compensation circuit means in circuit with said amplifier circuit means for processing an input audio signal to compensate said signal for the mechanical response parameters of said transducer in the region of resonance of said mechanical response parameters; and

second compensation circuit means in circuit with said amplifier circuit means and said first compensation circuit means for processing said audio signal to compensate said signal for the cone-air transfer characteristic of said transducer;

the compensated signal of said first and second compensation circuit means being coupled to said amplifier circuit means.

11. A method for compensating for the mechanical response parameters, cone-air transfer characteristic and cone breakup characteristic of an electro-acoustical transducer having a cone and mechanical response parameters, comprising: measuring the anechoic acoustic response of said transducer while driving said transducer with a constant coil current over a predetermined frequency range; connecting a first compensation circuit means having a resonant frequency corresponding to the measured resonance of said mechanical response parameters in circuit with said transducer, said first compensation circuit means having limited effect outside of the region of resonance of said mechanical response parameters; connecting a second compensation circuit means in circuit with said transducer, said second compensation circuit means having a resonance corresponding to the resonance of said cone-air transfer characteristic; and connecting a third compensation circuit means in circuit with said transducer, said third compensation circuit means having a resonance corresponding to the resonance of cone breakup and reinforcing the signal to said transducer in the region surrounding said cone breakup resonant frequency.

13. A method for compensating for the acoustical characteristics of a room exhibiting a resonance effect comprising placing a speaker in said room at a predetermined location, placing a microphone in said room at a first predetermined location, energizing said speaker with a source of pink noise over a predetermined frequency range, measuring the response at said microphone for a plurality of locations and for a plurality of orientations, averaging said response characteristics over said frequency range and accounting for the pink noise characteristics of said source to generate a resonance acoustical characteristic for said room, connecting a resonant compensation circuit

in series with said speaker, said compensation circuit having the resonance frequency corresponding to the resonance frequency of said measured acoustical characteristic for said room.

15. A method for compensating for the mechanical parameter resonance and the air-diaphragm transfer characteristic of a microphone having a diaphragm and mechanical response parameters comprising: defining the electrical response of said microphone for a constant amplitude of sound pressure level input over a frequency range; connecting a first compensation circuit means in circuit with said microphone, said first compensation circuit means having a resonant frequency corresponding to the mechanical parameter resonance of said microphone; and connecting a second compensation circuit means in circuit with said microphone and said first compensation circuit means, said second compensation circuit means having a resonance corresponding to the resonance of said air-diaphragm transfer characteristic of said microphone.

4,109,108

ATTENUATION OF SOUND WAVES IN DUCTS

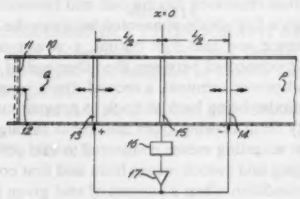
Brian Coxon, Whitley Bay, and Hubert Geoffrey Leventhall, London, both of England, assignors to National Research Development Corporation, London, England

Filed Sep. 7, 1977, Ser. No. 831,289

Claims priority, application United Kingdom, Oct. 1, 1976, 40832/76

Int. Cl.[2] E04B *1/99*; G10K *11/04*

U.S. Cl. 179—1 P **6 Claims**



1. A method of attenuating a sound wave propagating in a given direction along a duct through a fluid contained in the duct comprising detecting sound at a first position within the duct; and emitting sound into the duct at two positions spaced from the first position, one in the given direction and one in the opposite direction, so that the first position at which sound is detected is a null point at which sound radiations in the fluid emanating only from said two spaced positions substantially cancel; the sound emitted at the two positions being in relative antiphase and at equal amplitudes and at such phases relative to the phase of the detected sound that the resultant of the sound radiations emitted in the given direction substantially attenuates said sound wave propagating along the duct.

4,109,109

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF SIGNAL COMPONENTS OF PREDETERMINED FREQUENCY IN MULTIFREQUENCY PCM SIGNAL

Claude Auguste Molleron, Fontenay-aux-Roses, France, assignor to Societe Anonyme de Telecommunications, Paris, France

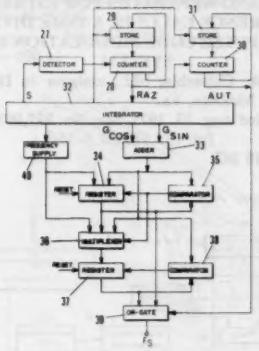
Filed Jan. 26, 1976, Ser. No. 652,647

Claims priority, application France, Jan. 31, 1975, 75 03125

Int. Cl.[2] H04J *3/12*

U.S. Cl. 179—15 BY **5 Claims**

1. A method for detecting the presence of signal components of a predetermined frequency in multifrequency PCM signals, wherein said frequencies belong to a group of standard frequencies, said signals are grouped into words distributed in time slots of a reference frame and the instantaneous value of each of the incoming signals is stored, said method comprising the steps of: integrating, for each of the time slots of a reference frame and for each of the standard frequencies, the product of the instantaneous value of the incoming signal by the instantaneous value of a digital signal characteristic of one of the standard frequencies along two separate paths, the said characteristic signal being in sine form following one of the paths and in cosine form following the other path; and calculating the sum of the absolute values of the results obtained following each of the paths, said sum having a high value when said predetermined frequency is present in the incoming signal, and being close to zero in the opposite case.



4,109,110

DIGITAL-TO-ANALOG CONVERTER

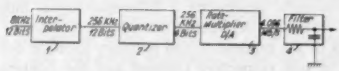
Michael John Gingell, Sawbridgeworth, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 642,876, Dec. 22, 1975, abandoned. This application May 16, 1977, Ser. No. 796,919

Claims priority, application United Kingdom, Feb. 20, 1975, 07157/75

Int. Cl.[2] H04J *15/00*; H03K *13/24*

U.S. Cl. 179—15 AP **11 Claims**



1. A digital-to-analog converter for a pulse code modulated (PCM) signal having a plurality of code groups and a given sampling rate comprising:

interpolating means having said PCM signal coupled thereto for increasing said given sampling rate of said PCM signal;

means for selecting a predetermined number of the most significant bits of each of said code groups of said increased sampling rate PCM signal;

means for decoding said predetermined number of most significant bits at a rate corresponding to said increased sampling rate to derive a pulse stream having a mean density which is proportional to an analog signal represented by said plurality of code groups;

means for selecting at least some of the least significant bits of each code of said code groups of said increased sam-

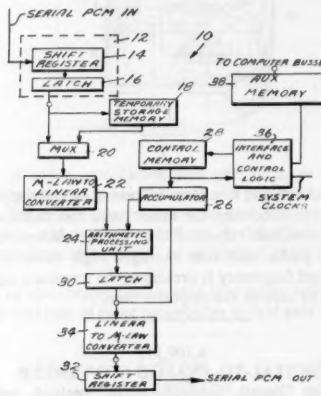
pling rate PCM signal for deriving an error signal; and feedback means for digitally adding said error signal to subsequently digitally sampled code groups.

4,109,111

METHOD AND APPARATUS FOR ESTABLISHING CONFERENCE CALLS IN A TIME DIVISION MULTIPLEX PULSE CODE MODULATION SWITCHING SYSTEM

Steven R. Cook, Columbia, Md., assignor to Digital Switch Corporation, McLean, Va.

Filed Aug. 23, 1977, Ser. No. 827,093
Int. Cl.[2] H04M *3/56*
U.S. Cl. 179—18 BC **11 Claims**



1. A time division multiplex communication system of the type wherein samples from a plurality of channels are represented as respective bytes of digital data, said bytes of data being combined to form a bit stream of sequential digital bits, bytes from respective ones of said plurality of channels occurring in said bit stream in a predetermined order, said system comprising:

an accumulator;

a memory having respective predetermined locations corresponding to each of said channels;

means, responsive to said bit stream, for, upon occurrence of a byte from a respective channel of a predetermined group of channels, generating a difference signal indicative of the difference between a quantity indicative of the contents of the predetermined memory location corresponding to said respective channel and the contents of said accumulator;

means, responsive to said difference signal for storing said difference in said accumulator to replace the previous contents of said accumulator;

means, responsive to said difference signal, for generating an output byte indicative of said difference;

means, responsive to said bit stream, for storing in the predetermined memory location corresponding to each particular channel each byte of said bit stream from that channel, each subsequent byte representative of a new sample from the particular channel replacing the previous contents of the predetermined memory location corresponding to the particular channel after the quantity indicative of the previous contents are subtracted from said accumulator contents;

means for deriving the sum of the difference stored in said accumulator and a quantity indicative of said subsequent byte; and

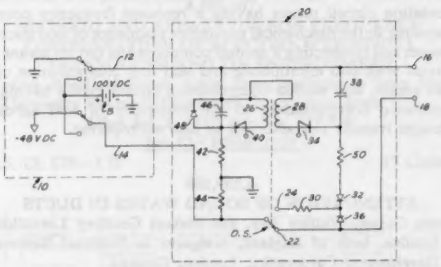
means for storing said sum in said accumulator to replace said difference.

4,109,112

TELEPHONE ISOLATION DEVICE

Donald E. Denman, and Samuel L. Haring, both of Mansfield, Ohio, assignors to Del-Tronics Associates, Inc., Mansfield, Ohio

Continuation of Ser. No. 690,622, May 27, 1976, abandoned.
This application Oct. 11, 1977, Ser. No. 840,774
Int. Cl.[2] H04M *1/00*; H04B *3/46*
U.S. Cl. 179—81 R **19 Claims**



9. Component circuitry comprising: switch means having an input and first and second outputs and being adapted to connect said first output to said input when in a first condition and to connect said second output to said input when in a second condition, a first resistance having one end connected to said second output, a first diode connected between the other end of said resistance and said first output, a power terminal, a branch circuit connected between the other end of said resistance and said power terminal, a second diode in said branch circuit, said diodes being back to back to prevent current of a given polarity from flowing from said input through said diodes, and first actuating means connected to said power terminal for changing said switch means from said first condition to said second condition when a current of said given polarity is supplied to said power terminal.

4,109,113

COMMUNICATION SYSTEM OPTIMIZED POOLED LINE ARRANGEMENT

Charles Eugene Allison, Jr., Holmdel; Francis Michael Fenton, Middletown; Tse Lin Wang, Matawan, and Carl Dennis Weiss, Little Silver, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1977, Ser. No. 847,214
Int. Cl.[2] H04Q *3/64*
U.S. Cl. 179—99 **13 Claims**

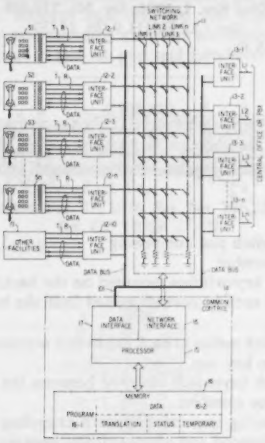
1. A line pool control arrangement for use in a communication system having a plurality of stations, each station having access to any one of a number of lines serving said system by the momentary operation of a button at a telephone station set having a plurality of such buttons, said line pool control arrangement comprising

means responsive to the enabling of certain ones of said buttons at each said station for enabling a communication connection to one line in a pool of said lines associated with said enabled button,

means for assigning a first priority to a set of said lines in said line pool such that when a pool line button is enabled at any said station only those idle lines in said set of lines having a first priority can become connected to said enabling station,

means for assigning a second priority to certain other of said lines outside said line pool such that when a pool line

button is operated at any said station and all of said lines in said line pool set of lines are busy a communication con-



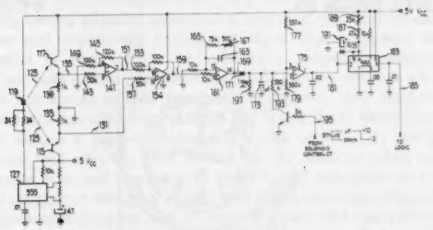
nection is established to an available one of said other lines having said second priority.

4,109,114

PROGRAMMABLE PHONOGRAPH DEVICE

Ralph H. Baer, Manchester, N.H., and Donald K. Fletchic, Arlington Heights, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jul. 14, 1976, Ser. No. 705,138
Int. Cl.[2] G11B *19/14*
U.S. Cl. 179—100.4 D **9 Claims**



1. A programmable phonograph device providing automatic sound track selection from a record having a plurality of sound track bands spaced apart by a plurality of intraband land areas, comprising:

an electro-optic scanner including a light emitting diode and two phototransistors;

land sensing means including a differential amplifier having first and second inputs, means for supplying a first signal corresponding to the current flowing in one of said phototransistors to said first input, means for supplying a second signal corresponding to the current flowing in the other one of said phototransistors to said second input, and means for deriving an output signal proportional to the difference between said first and second signals at the output of said differential amplifier, and

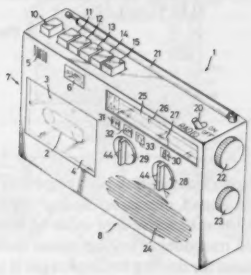
programable control logic means controlled by said output signal for storing a predetermined selection of sound track bands to be played and positioning the stylus on the record to play said preselected record bands.

4,109,115

MAGNETIC RECORDING APPARATUS WITH A PLURALITY OF SIGNAL RECEIVING DEVICES

Harunori Yamamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 607,955
Claims priority, application Japan, Aug. 29, 1974, 49-99228; Aug. 29, 1974, 49-99230
Int. Cl.[2] G11B *31/00*
U.S. Cl. 179—100.11 **25 Claims**



1. A combination comprising:

A. magnetic recording apparatus;

B. a first receiving means to receive electromagnetic wave signals in a first band of frequencies and to produce therefrom a first audio signal;

C. second receiving means to receive electromagnetic signals in a second band and to produce therefrom a second audio signal;

D. third receiving means to receive electromagnetic signals in a third band and to produce therefrom a third audio signal;

E. audio signal monitoring means;

F. first selecting means to connect either of said audio signals, selectively, to said recording apparatus to record the selected audio signal;

G. second selecting means to connect either of said audio signals, selectively, to said monitoring means; and

H. mechanical interlocking means to prevent either of said audio signals from being connected to said recording apparatus while the other of said audio signals is connected to said monitoring means, said first selecting means selectively connecting any of said audio signals to said recording apparatus, said second selecting means selectively connecting any of said audio signals to said monitoring means, and said mechanical interlocking means selectively connecting either of said first or second audio signals to said recording apparatus while said third audio signal is connected to said monitoring means, or selectively connecting either of said first or second audio signals to said monitoring means while said third audio signal is connected to said recording apparatus.

4,109,116

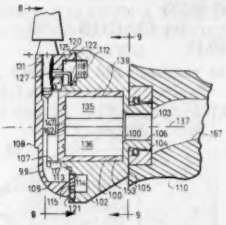
HEARING AID RECEIVER WITH PLURAL TRANSDUCERS

John A. Victoreen, 1314 Druid Rd., Maitland, Fla. 32751

Filed Jul. 19, 1977, Ser. No. 817,021
Int. Cl.[2] H04R *25/00*
U.S. Cl. 179—107 E **10 Claims**

1. A hearing aid comprising output transducing means for translating an amplified electrical signal into audible sound pressures and having a pair of transducers, a case housing said transducers and having a sound pressure outlet passageway, and means within and rigidly fixing said transducers to said case, each of said transducers having housing/component, a vibratably drivable diaphragm with opposite faces and located within said housing component, an acoustically sealed cham-

ber located within said housing component at one of said faces, and a sound pressure chamber located within said housing component at the other of said faces, said housing component having an outlet that communicates with said sound chamber and with the outlet of said passageway, said diaphragm being



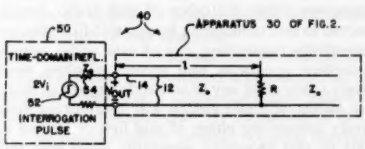
arranged in a face to face relation with respect to the other said diaphragms, said sound pressures having wave lengths that exceed the maximum dimension of each of said diaphragms-,and each of said transducers having means located within its housing component for driving its diaphragm in phase with but in opposite directions to the diaphragm of the other transducer.

4,109,117

RANGE DIVISION MULTIPLEXING

Edwin H. Wrench, Jr.; Jay C. Hicks, both of San Diego, and Joseph F. McCartney, Solana Beach, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 2, 1977, Ser. No. 831,278
Int. Cl.[2] H04B *1/58;* **H04J** *3/08;* **G01V** *1/22;* **H04Q** *9/00*
U.S. Cl. 179—175.3 F **8 Claims**



APPARATUS FOR INTERROGATING THE CABLE.

1. Apparatus for range division multiplexing, comprising:
a coaxial cable having a characteristic impedance of Z_o, and defining an input end and an output end;
a first plurality of N transducing means, disposed along and connected to the cable at distances of *l*, 2*l*, . . . , N*l*, from the input end of the cable, the means being able to transduce a voltage into an impedance which is substantially a resistance $R, R >> Z_o/2$; and
a second plurality of N transducing means, for transducing a physical parameter into a voltage, the output of each means being connected to an input of one of the first transducing means;
with the result that, upon connection of a time-domain reflectometer at the input of the cable, impedance discontinuities at each location along the cable of the N first transducing means may be detected.

4,109,118

KEYSWITCH PAD

Victor Kley, 2212 Byron St., Berkeley, Calif. 94702

Filed Sep. 1, 1976, Ser. No. 719,408
Int. Cl.[2] H01H *9/20, 13/50*
U.S. Cl. 200—5 E **38 Claims**

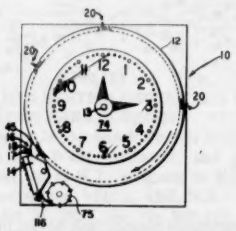
32. A keyswitch pad comprising
a backing member
at least two keyswitches mounted on the backing member,
a key cap in each keyswitch spaced from the backing member,
switch contact means in each keyswitch actuated by depression of the key cap,
a bag in each keyswitch disposed between the key cap and the backing member,
said bags having respective upward extending portions annularly disposed and concentrically engaging the underneath sides of the respective key caps,
a fluid filling the bags and having a pressure to urge at least one of the key caps to a raised position, and
a coupling tube connecting the bags of each adjacent pair of the keyswitches so that the bags are in fluid communication with each other.

4,109,119

PROGRAM CONTROL DEVICE

Harry C. Baelz, Warminster, and Harrison E. Cassel, Perkasie, both of Pa., assignors to Schulmerich Carillons, Inc., Sellersville, Pa.

Filed Nov. 8, 1976, Ser. No. 739,609
Int. Cl.[2] H01H *43/00;* **F16H** *53/00*
U.S. Cl. 200—38 BA **6 Claims**



1. A program control device comprising a continuously rotatably driven program control body having a periphery thereof; a plurality of stationary, actuable programming members positioned adjacent said periphery at different locations transverse to the direction of rotation of said control body; a tab having an integral body segment with a length and a plurality of integral, selectively removable contact segments aligned in an array along said length, said tab further having a support segment centrally located therein and extending from said body segment in a direction normal to said length and away from said array of contact segments, said support segment having a notch therein; said program control body having a plurality of discs each fixed in a plane perpendicular to the axis of rotation of said body, each of said discs having at least one radial notch at the periphery thereof, said notches being aligned transversely for demountably supporting said tab on said discs adjacent said periphery such that said contact segment array extends transversely of said program control body,

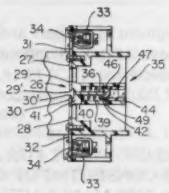
a first of said discs being centrally positioned to receive said tab support segment so that the disc notch and the support segment notch interfit, and being of a thickness adapted to provide a friction fit between said disc and said support segment, whereby said programming members are selectively engaged during transport of said tab past said members.

4,109,120

ELECTRICAL UNIT HAVING A BUS-BAR AND A SELECTOR AND METHOD OF MAKING THE SAME

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 27, 1976, Ser. No. 736,210
Int. Cl.[2] H01R *13/70*
U.S. Cl. 200—51 R **9 Claims**



1. In an electrical unit having a frame provided with a terminal and a bus-bar electrically interconnected to said terminal for transmitting electrical current between said terminal and desired means electrically interconnected to said bus-bar, said bus-bar having a pair of bus-bar sections spaced from each other and having a selector for electrically interconnecting said bus-bar sections together when said selector is in one position relative to said frame and for electrically disconnecting said bus-bar sections from each other when said selector is in another position relative to said frame, the improvement wherein said selector comprises an electrical connector that wedges against both of said bus-bar sections when said selector is in said one position thereof, said bus-bar sections respectively having adjacent ends thereof disposed spaced from each other and respectively having end edges disposed spaced and parallel to each other, said electrical connector wedging against both of said adjacent ends of said bus-bar sections when said selector is in said one position thereof, said electrical connector having a substantially flat triangularly shaped part that defines a pair of angled edges that respectively wedge against said adjacent ends of said bus-bar sections when said selector is in said one position thereof, said triangular part of said connector wedging against said end edges when disposed transverse thereto by said selector being in said one position thereof and being disposed spaced inwardly from and parallel to said end edges when said selector is in said other position thereof.

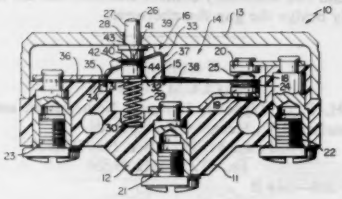
8. In a method of making an electrical unit having a frame provided with a terminal and a bus-bar electrically interconnected to said terminal for transmitting electrical current between said terminal and desired means electrically interconnected to said bus-bar, said bus-bar having a pair of bus-bar sections spaced from each other and having a selector for electrically interconnecting said bus-bar sections together when said selector is in one position relative to said frame and for electrically disconnecting said bus-bar sections from each other when said selector is in another position relative to said frame, the improvement comprising the steps of forming said selector with an electrical connector that wedges against both of said bus-bar sections when said selector is in said one position thereof, and forming said eletrical connector with a substantially flat triangularly shaped part that defines a pair of angled edges that respectively wedge against adjacent ends of said bus-bar sections when said selector is in said one position thereof to dispose said flat triangular part transverse to spaced parallel end edges of said adjacent ends and to dispose said flat triangular part spaced inwardly from said parallel to said end edges when said selector is in said other position thereof.

4,109,121

ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Werner R. Bauer, Radnor, and William N. Smith, Hatboro, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jul. 22, 1976, Ser. No. 707,635
Int. Cl.[2] H01H *5/18*
U.S. Cl. 200—67 E **11 Claims**



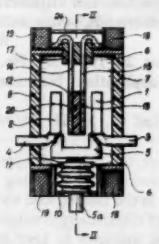
1. An electrical switch construction comprising a housing means carrying a pair of spaced contact stops and a snap switch blade having a contact portion for being snapped between said stops when said blade is moved overcenter, and a movable actuator means carried by said housing means for moving said blade overcenter in one direction when said actuator means is moved in one direction thereof and for moving said blade overcenter in the opposite direction when said actuator means is moved in the opposite direction thereof, said actuator means having adjustable means for adjusting the movement differential of said actuator means, said actuator means including an actuator plunger, said actuator means including an actuator spring that is moved by movement of said actuator plunger, said actuator spring being operatively interconnected to said blade to move said blade as said actuator spring is moved, said adjustable means of said actuator means comprising an adjustable gap in said actuator plunger that defines a pair of spaced shoulders on said actuator plunger that are adapted to respectively engage said actuator spring.

4,109,122

VACUUM SWITCH WITH INTERMITTENTLY ENERGIZED ELECTROMAGNETIC COIL

Joseph H. F. G. Lipperts, Hengelo (O), Netherlands, assignor to Hazemeijer B.V., Hengelo (O), Netherlands

Filed Mar. 1, 1977, Ser. No. 773,273
Int. Cl.[2] H01H *33/66*
U.S. Cl. 200—144 B **6 Claims**



1. A vacuum switch which comprises:
an evacuated envelope;
two stationary contact elements mounted within said evacu-

ated envelope such that an electrically insulating gap is formed therebetween;

an electromagnetic coil capable of producing a magnetic field in the region of said gap between said contact elements and substantially in parallel with the width of said gap;

two metal discs positioned with said gap between said contact elements, an electrically insulating disc separating said two metal discs, each of said two metal discs being supported by separate coil terminal means connected to said electromagnetic coil, and

a movable U-shaped contact element mounted within said evacuated envelope such that the end portions of said U-shaped contact element are positionable to contact each of said two stationary contact elements and act to electrically bridge the gap therebetween.

4,109,123

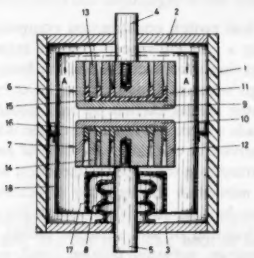
VACUUM SWITCH

Joseph H. F. G. Lipperts, Hengelo, Netherlands, assignor to Hazemeijer B.V., Hengelo, Netherlands

Filed Jan. 31, 1977, Ser. No. 764,238

Int. Cl.[2] H01H *33/66*

U.S. Cl. 200—144 B **6 Claims**



1. A vacuum switch comprising means forming a gas-tight sealed evacuated envelope and having therein a stationary contact element and a movable contact element movable towards or away from the stationary contact element, at least one of the contact elements consisting of a disc-shaped contact portion and a bush-shaped portion connected to or integral with the periphery of the disc-shaped portion and extending in a direction away from the associated contact element, a spiral conductor positioned radially within the bush-shaped contact portion and being electrically connected in series with the associated contact element, the spiral conductor producing an electric field in order to improve the current interruption characteristics of the vacuum switch.

4,109,124

CIRCUIT-BREAKERS FOR HIGH VOLTAGES

Rintje Boersma, Harmelen, and Gijsbert Waldemar Irik, Bilthoven, both of Netherlands, assignors to Coq B.V., Utrecht, Netherlands

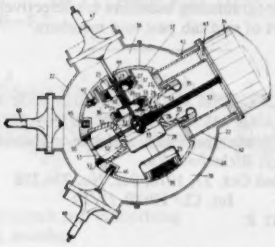
Filed Mar. 26, 1976, Ser. No. 670,963

Claims priority, application Netherlands, Apr. 7, 1975, 7504130

Int. Cl.[2] H01H *33/54*

U.S. Cl. 200—148 B **25 Claims**

1. A circuit-breaker for high voltages comprising a metal casing, at least one monophase switching unit which is insulatedly accommodated in the casing, said switching unit comprising at least one pair of electrically conductive fixed connecting members, at least one insulator to keep said connecting members spaced apart and electrically separated, at least one pair of relatively movable cooperating contacts to make and break electrical connection between said members; at least two terminal bushings extending through the wall of the casing, each one of said bushings being adapted to connect a connecting member with an end of the electric circuit to be controlled, each connecting member being in the form of a cap in the



shape of a hollow segment of a sphere and the two connecting members being disposed in spaced opposition with said insulator interposed therebetween.

4,109,125

CONTACT ARRANGEMENT FOR AN ELECTRIC ARC-ELECTRODE CONSISTING OF GRAPHITE AND A METHOD FOR THE MANUFACTURE THEREOF

Keith Nelson Melton, Fislisbach, and Renata Sebalj, Neuenhof, both of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Apr. 5, 1976, Ser. No. 673,549

Claims priority, application Switzerland, May 28, 1975, 6805/75

Int. Cl.[2] H01H *1/02*

U.S. Cl. 200—268 **5 Claims**

1. A contact arrangement particularly for high-voltage power switches having a gaseous isolation means, comprising:

an electric arc-electrode consisting of a graphite member;

a contact spud consisting essentially of a metal having a high melting point selected from the group consisting of molybdenum, molybdenum-based alloys, wolframite and wolframite-based alloys being disposed in at least the surface portion of said electrode; and

a soldering layer containing at least one carbideforming metal disposed between said graphite member and contact spud and connecting said contact spud to said electric arc-electrode.

4,109,126

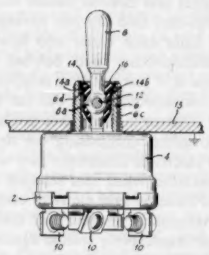
CONDUCTIVE COATING ON SWITCH LEVER SEAL FOR RFI ELIMINATION

Werner B. Halbeck, Mequon, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 28, 1976, Ser. No. 736,391

Int. Cl.[2] H01H *9/04, 9/12*

U.S. Cl. 200—302 **7 Claims**



1. An electric switch comprising:

a switch housing at least partly of metal having an opening therein and normally being grounded in use;

a metal switch actuator extending out through said opening so as to be accessible for operation to actuate the switch;

means mounting said metal switch actuator in said opening;

a resilient seal within said opening closing the space around said metal switch actuator to seal the interior of said switch housing from the outside and being flexible to afford relatively unimpeded movement of said metal switch actuator, said seal having first and second surfaces in sealing engagement with said actuator and said housing, respectively, and third and fourth surfaces exposed to the inside of said housing and to the outside, respectively;

and a conductive elastomeric coating on and covering at least one of said exposed surfaces of said seal and adhering thereto electrically groundng said metal switch actuator through said housing to avoid RFI radiation therefrom.

4,109,127

APPARATUS AND METHOD FOR CASE HARDENING STEEL TOOLS BY APPLICATION OF HEATING PULSES

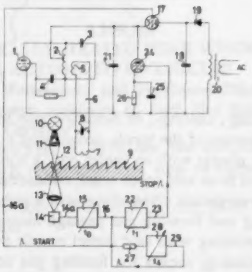
Frank Früngel, Herwigredder 105a, 2000 Hamburg 56, BRD, Fed. Rep. of Germany

Division of Ser. No. 489,946, Jul. 18, 1974. This application Feb. 25, 1976, Ser. No. 661,165

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1973, 2337684

Int. Cl.² H05B *5/04*

U.S. Cl. 219—7.5 **6 Claims**



1. Apparatus for case hardening a predetermined portion of the surface of a steel tool, comprising, in combination, first means including inductive coupling means for applying at least a first and second pulse to said predetermined portion of said surface, thereby heating said portion; second means connected to said first means for adjusting the pulse width of said pulses to pulse widths below 100 milliseconds; and third means connected to said first means for adjusting the time interval between said first and second pulse.

4,109,128

METHOD FOR THE PRODUCTION OF SEMICONDUCTOR RODS OF LARGE DIAMETER AND DEVICE FOR MAKING THE SAME

Franz Kohl, Burghausen, Fed. Rep. of Germany, assignor to Wacker-Chemitronik Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

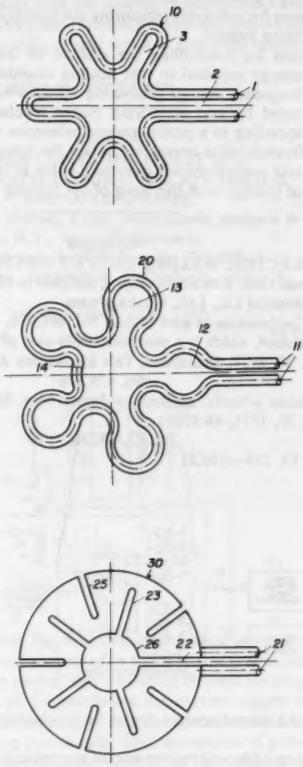
Filed Aug. 17, 1976, Ser. No. 715,073

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1975, 2538854

Int. Cl.² H05B *5/18*; B01D *9/00*

U.S. Cl. 219—10.43 **3 Claims**

1. An induction heating coil for the production of dislocation-free monocrystalline semiconductor rods of large diameters, said coil being a single turn coil the ends of which merge into the current supply lines, said coil encircling its center point in three to seven, approximately circular, similar loops, which follow one after another, and merging into the current supply lines at a curve remote from the center, said loops each defining a recess corresponding to the free space formed between the ends of the coil as they merge into the current supply



lines, the recesses being arranged in a circle about the axis of rotation passing through the center of the coil, wherein the distance between said free space and the neighboring recesses is equal to the distance between two adjacent recesses.

4,109,129

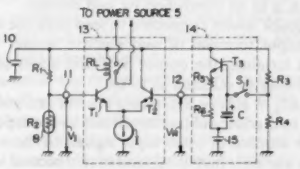
HIGH FREQUENCY ENERGY APPARATUS HAVING AUTOMATIC FINAL TEMPERATURE COMPENSATOR

Kenji Satoh, and Mitsuru Watanabe, both of Yokohama, Japan, assignors to Hitachi Heating Appliances Co., Ltd., Japan

Filed Dec. 21, 1976, Ser. No. 752,851

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B **23 Claims**



1. A high frequency energy apparatus for heating an object with high frequency energy, comprising:

a heating chamber for containing and heating said object;
means for generating the high frequency energy;
means for introducing to said heating chamber the high frequency energy generated by said high frequency energy generating means;
means for relatively measuring the temperature of the object being heated;
means for controlling the amount of the high frequency energy supplied to said heating chamber from said high frequency energy generating means when the value measured by said measuring means reaches a value corresponding to a predetermined reference value; and
reference value correcting means for automatically varying said predetermined reference value in the same direction of change with the lapse of the heating time.

4,109,130

ELECTRIC WELDER OUTPUT CONTROL DEVICE

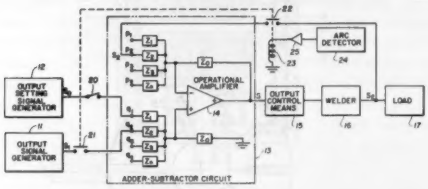
Takeshi Oku, Kawanishi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 481,070, Jun. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 310,698, Nov. 30, 1972, abandoned. This application Apr. 26, 1976, Ser. No. 679,976

Claims priority, application Japan, Nov. 30, 1971, 46-96998; Nov. 30, 1971, 46-97001

Int. Cl.² B23K 9/10

U.S. Cl. 219—130.21 **2 Claims**



1. An output control device for an electric welder, comprising

(a) an adder-subtractor circuit comprising a differential type operational amplifier and having first, second and third input terminals connected to said amplifier, and an output terminal for providing an output signal S,

(b) first signal generating means coupled to said first input terminal for applying thereto a signal S_1 indicating a desired output of an electric welder,

(c) second signal generating means coupled to said second input terminal for continuously applying thereto a signal S_0 for setting the open-loop initial transient output of said electric welder to approximate the desired steady state operating output of said welder,

(d) controller means connected to receive the output voltage S of said adder-subtractor circuit so as to control the output of said electric welder,

(e) means for coupling said electric welder to said output control device,

(f) means associated with said welder to provide an output signal S_2 corresponding to the actual output of said welder which is to be controlled by said device,

(g) feedback means connected to feed back the signal S_2 from an output terminal of said electric welder to said third input terminal, the output S of said adder-subtractor circuit being so selected as to be

$S = aS_0 + b(S_1 - S_2)$, where a is the ratio of the output S of said adder-subtractor circuit to the input signal S_0 in the absence of other input signals to the adder-subtractor circuit which is applied to said second input terminal and is less than a level at which said operational amplifier is saturated and b is a ratio of said output S to the input signals S_1 and S_2 in the absence of other input singals to the adder-subtractor circuit applied to said first and third input terminals respectively, whereby the closed-loop steadystate output of said electric welder may be controlled in response to said output S of said adder-subtractor circuit and

(h) switching means for initially precluding closed-loop operation of said welder and subsequently enabling said feedback means by said signals S_1 and S_2 to said first and third input terminals respectively, only when a welding arc is struck, said signal S_0 continuing to be applied to said second input terminal after the arc is struck.

4,109,131

WELDING-, CUTTING-, OR HEATING TORCH

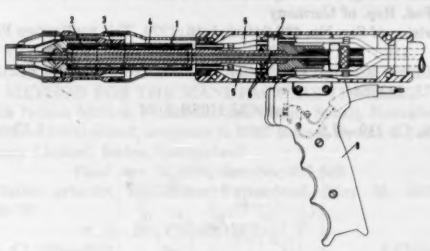
Jürgen Schlüter, Laatzen, Fed. Rep. of Germany, assignor to E. Schlüter Fachhandel Für Schweisstechnik, Laatzen

Filed Apr. 29, 1977, Ser. No. 792,301

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619177

Int. Cl.² B23K 9/00

U.S. Cl. 219—137.62 **19 Claims**



1. A welding-, cutting-, or heating-torch in which a gas is used for operation of the torch, comprising a torch head having an outlet nozzle with an outlet end; a torch housing rearwardly spaced from said torch head; connecting means in form of outer sleeve means connecting said torch head with said torch housing and forming gas passage means having a front end communicating with said outlet nozzle and a rear end in said torch housing; means for feeding gas necessary for the operation of the torch into said rear end of said gas passage means so that such gas passes through said gas passage means and leaves the latter through said front end thereof; and elongated hermetically closed heat transmitting means confined in its entirety within said torch for automatically transporting heat from a heat receiving zone which is adjacent said torch head is shielded from the gas passing through said gas passage means to a heat releasing zone which is rearwardly of said heat receiving zone is impinged by the gas passing through said gas passage means, whereby a region of the torch head which is heated to a high temperature during operation is cooled.

4,109,132

AUTOMATIC WELDING MASK SHUTTER LENS SYSTEM

Aristotel Butoi, 689 Seneca Ave., Ridgewood, N.Y. 11227

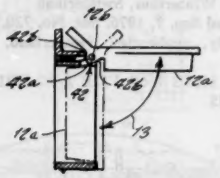
Filed Feb. 22, 1977, Ser. No. 770,638

Int. Cl.² B23K 9/32

U.S. Cl. 219—147 **1 Claim**

1. An automatic welding mask shutter lens system, comprising in combination, a welding helmet having a window opening on a front side thereof, a shutter lens mounted in a lens frame, said frame being pivotable about a pin so to selectively fit in said window opening when said frame is in a vertical position, or extend forwardly outward therefrom when said frame is in a horizontal position, and an electrical system operated by a push button on a welding rod holder for pivoting said lens frame between said vertical and horizontal positions; said electrical system including an iron bar formed on said lens

frame and protruding upwardly therefrom at an angle of 17 degrees along an axis passing transversely through said pivot pin, an electromagnet rigidly mounted on said helmet front side and being located above said frame pivot pin, said iron bar being pivotable across a center of a magnetic field space under said electromagnet so that when said frame is vertical, said iron bar is tilted forwardly, and when said frame is horizontal, said iron bar is tilted rearwardly; said electromagnet being in an



electric circuit with a switch in a handle of said welding rod holder, and which is operated by said pushbutton, an on-off switch for selective connection to either a 110v. or 220v. power source and a circuit breaker; and a spring-biased detent pin on said helmet bearing against a cam face on said lens frame forcing said frame to travel over a cam rise between a cam notch at each end of said cam, so that said frame travels a full distance of said travel and thereafter is retained in either a fully horizontal or fully vertical position.

4,109,133

ELECTRICALLY HEATED REAR WINDOW FOR AUTOMOTIVE VEHICLES

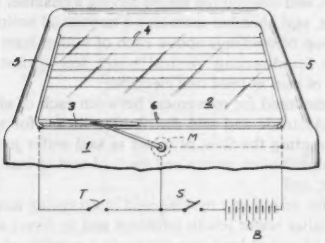
Edgar Hänle, Wettstetten, and Ferdinand Plëch, Ingolstadt, both of Germany, assignors to Audi Nsu Auto Union AG, Neckarsulm, Germany

Filed Feb. 18, 1976, Ser. No. 659,018

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1975, 2507037

Int. Cl.[2] A47L *1/16*; H05B *3/26*; B60S *1/02*

U.S. Cl. 219—203 **10 Claims**



1. A rear window assembly for an automotive vehicle comprising:

a rear window;

a wiper for said window having a blade adapted to sweep across the same and having a rest position over a limited portion of the width of said window along the lower edge thereof;

an array of substantially uniformly spaced primary resistance-heating conductors bonded to said window over an upper zone thereof, the lower zone of said window below said upper zone and above said lower edge being free from resistance-heating conductors and having an unobstructed field of view;

at least one secondary resistance-heating conductor disposed and bonded to said window below said lower zone in the immediate region of and extending over said rest position along only said lower edge for heating said rest position of said wiper to release said blade under freezing conditions upon electrical energization of said at least one secondary conductor, said at least one secondary conductor being spaced from the lowermost conductor of said array by a distance greater than the spacing of the primary conductors of said array and extending across the bottom portion of said lower zone of said window free from conductors; and

means for energizing said conductors.

4,109,134

POWER CONTROL CIRCUIT AND ELECTRO(PHOTO)GRAPHIC APPARATUS EMPLOYING SAME

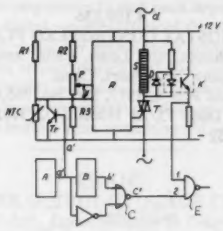
Jozef Marie Van Herten, Venlo, Netherlands, assignor to Ocevan der Grinten N.V., Venlo, Netherlands

Filed Aug. 2, 1976, Ser. No. 710,398

Claims priority, application Netherlands, Aug. 8, 1975, 7509461

Int. Cl.[2] H05B *1/00, 1/02*

U.S. Cl. 219—216 **10 Claims**



1. A safety circuit for controlling the power transmitted by a switching element connected in series with a power element on an a.c. voltage source, said switching element forming part of a control circuit for regulating the current supply to the power element, comprising in addition to said control circuit means for blocking periodically the transmission of power by said switching element under control by said control circuit and means effective in intervals of the interruption of said transmission by said blocking means for detecting whether power is then being transmitted to the power element.

4,109,135

HIGH EFFICIENCY FUSER ROLL ASSEMBLY FOR XEROGRAPHIC MATERIAL

Henry Thomas Minden, Concord, and Richard W. Premo, Shrewsbury, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,505

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—216 **4 Claims**

1. An efficient fuser roll assembly for use in a xerographic copier including:

frame means,

shaft means journalled within said frame means,

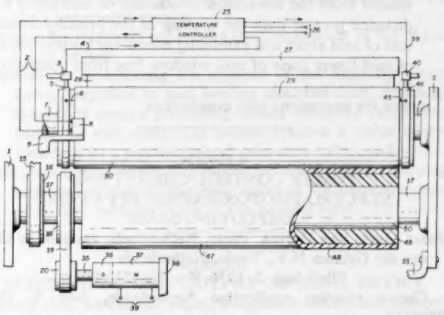
thermally insulating roll means disposed coaxially upon said shaft means and having cylindrical outer surface means and first and second ends,

first and second slip ring means bonded in intimate relation at said cylindrical outer surface means at the respective first and second ends thereof,

heater means in the form of a flat tape having a predetermined electrical resistance bonded in intimate relation at said cylindrical outer surface means and coupled between said first and second slip ring means, and

a thin layer of electrically insulative tetrafluoroethylene resin enveloping said heater means and said thermally

insulating roll means for forming the active fusing surface of said fuser roll assembly and providing a direct conductive heat path between said heater means and said active fusing surface.



4,109,136

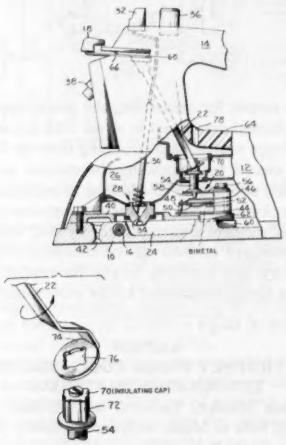
THERMOSTAT CONTROLLED FLATIRON

Charles A. Balchunas, Alta Loma, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed Feb. 4, 1977, Ser. No. 765,641

Int. Cl.[2] D06F *75/26*; H05B *1/02*; H01H *37/12*

U.S. Cl. 219—252 **5 Claims**



1. In an electric flatiron having an electrically heated soleplate provided with a central upstanding boss thereon, a handle on said soleplate, said handle including a front portion located forwardly and upwardly of said boss, said handle containing a temperature adjusting lever in front portion thereof with said lever being pivoted in said handle, an improved temperature regulating assembly comprising,

a snap action thermostat for regulating the temperature of said soleplate supported on said boss and having a substantially vertically movable adjusting screw to vary the thermostat settings,

an insulated cap fixedly connected to the top of said screw for rotation therewith,

said cap having an outer splined surface,

a rod connected at one end to said lever forwardly of said screw for rotation by lever movement,

said rod having an offset portion at its other end loosely fitted in driving engagement over the splined surface of said cap,

said offset portion being slidable vertically over the splined surface thereby forming a universal-like connection between said rod and screw as the rod is rotated by said lever to turn said screw and vary the thermostat setting.

4,109,137

ELECTRIC STEAM GENERATOR

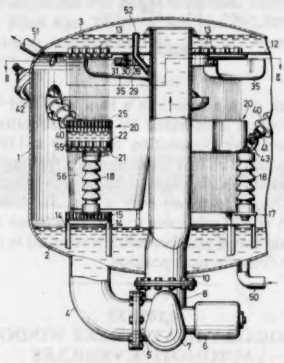
Jaroslav Zabelka, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Sep. 7, 1976, Ser. No. 720,737

Claims priority, application Switzerland, Jan. 30, 1976, 1188/76

Int. Cl.[2] H05B *3/60*; F22B *1/30*; H01C *10/02*

U.S. Cl. 219—285 **8 Claims**



1. In an electric steam generator, the combination comprising

a vessel;

at least one horizontally extending dish-shaped electrode in said vessel for receiving and heating a supply of water and having openings therein forming outlets for the received water to form vertical water jets;

a distribution means located above said at least one electrode, said distribution means having a chamber to receive water, said chamber including a horizontal bottom having a group of openings above each of said at least one electrode for directing vertical water jets against and into each of said at least one electrode;

means mounted for movement between each of said at least one electrode and said distribution means for selectively intercepting the flow of water in said water jets between said distribution means and each of said at least one electrode; and

means for selectively moving said intercepting means across said latter water jets to intercept and to divert away from each of said at least one electrode a number of said latter water jets proportional to the distance moved between each of said at least one electrode and said distribution means.

4,109,138

FAN-HEATER APPLIANCE WITH ADJUSTABLE FAN SPEED

Helmut Ohnmacht, Kandel, Pfalz, Fed. Rep. of Germany, assignor to Firma Fritz Eichenauer, Fed. Rep. of Germany

Filed Jul. 14, 1976, Ser. No. 705,275

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1975, 2531687

Int. Cl.[2] F24H *3/04*; A45D *20/10*; H05B *3/02*

U.S. Cl. 219—364 **5 Claims**

1. A fan-heater appliance, comprising a housing, a low voltage fan motor for producing a flow of air within said housing, a resistance heating wire coiled linearly to form a series of tips

with at least one row of coils transverse to the direction of said air flow, and means for securing said at least one row of coils within said housing, a plurality of the tips of the coils being each placed within a respective headed tubular rivet with the heads of all the tubular rivets being arranged in a continuous path, and a current collector connected in an electrical circuit

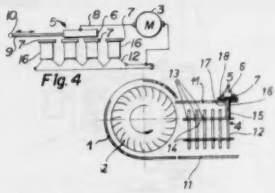


Fig. 4

with said fan motor, said current collector being moveable along said path in electrically conductive contact with selected ones of the heads of the tubular rivets and means for selectively displacing said current collector over said tubular rivets so as to provide an almost stepless adjustment of said fan motor speed over a relatively large rotational speed range.

4,109,139

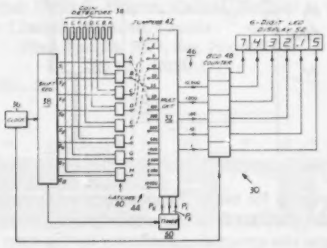
MULTI-NATIONAL COIN TOTALIZER

Lonnie S. McMillian, Huntsville, and Harold G. Culp, Union Grove, both of Ala., assignors to Systems & Technic S.A., Nyon, Switzerland

Continuation of Ser. No. 460,531, Apr. 12, 1974, abandoned. This application Mar. 2, 1976, Ser. No. 663,058

Int. Cl.[2] G07D *9/00*

U.S. Cl. 235—92 CN **15 Claims**



1. A coin totalizer device comprising coin identification means for producing coin identification signals, coin value adding means, terminal means including two sets of terminals, one set for said identification signals and the other for said adding means, and means supporting said terminal sets adjacent one another and adapting said terminals to receive variable interconnections in order to provide scaling of the coin identification signals in accordance with the values of said coins in different countries, a multiplying circuit connected to said adding means, said other set of terminals comprising input terminals for said multiplying circuit, said multiplying circuit being adapted to produce a pre-selected multiplication at each of said input terminals, the number of said input terminals being greater than that necessary for totalizing the coinage of any single one of a pre-selected group of countries.

4,109,140

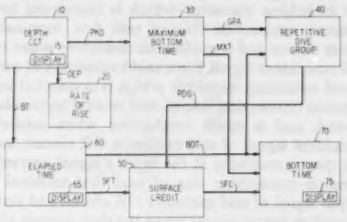
DIVER'S CONTROL AND INDICATION APPARATUS

Richard Henry Etra, 67-40 Yellowstone Blvd., Forest Hills, N.Y. 11375

Filed Apr. 19, 1977, Ser. No. 788,749

Int. Cl.[2] G07C *1/10*

U.S. Cl. 235—92 MT **18 Claims**



1. Diver's apparatus comprising depth determining means including means for determining the peak depth attained during a dive, means responsive to said peak depth determination for generating a digital representation of the allowable bottom time for said dive, means for generating a digital representation of the bottom time elapsed during said dive, and means responsive to said allowable bottom time representation and said elapsed bottom time representation for generating a visual indication of the bottom time remaining for said dive.

4,109,141

COUNTER OUTPUT DETECTOR CIRCUIT

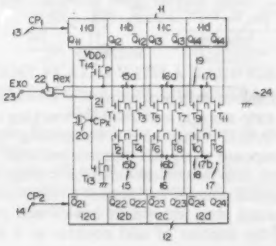
Minoru Sasaki, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 2, 1977, Ser. No. 830,148

Claims priority, application Japan, Sep. 9, 1976, 51-107266

Int. Cl.[2] H03K *21/10*

U.S. Cl. 235—92 CA **4 Claims**



1. A counter output detector circuit comprising:

a counter for counting input pulses and including first binary memory units which are connected in series and produce binary output signals ("1" or "0") and their negated binary output signals "$\overline{1}$" or "0"), respectively;

a memory device for storing reference data therein to be compared with the output data from said counter and which includes second binary memory units of the same number as of said first ones, producing binary output signal ("1" or "0") and their negated binary output signals ("$\overline{1}$" or "0"), respectively;

a plurality of switching circuits which receive as control input signals said binary output signals and their negated output signals from the pairs of corresponding said first and second memory units of said counter and said memory device except the pair of corresponding said first and second memory units at the first stage thereof, and open the paths between first and second terminals when the

contents coincide between said first and second memory units;

an exclusive OR circuit receiving at the input at least one output signal of said first stage binary memory unit of said counter and at least one output signal of said first stage binary memory unit of said memory device and producing a coincident signal when the contents coincide between said first stage memory units;

a first switching transistor which is connected between a common connection line of said first terminals and a power source and is made nonconductive when receiving said coincident signal from said exclusive OR circuit;

a second switching transistor which is connected between a common connection line of said second terminals and the ground, and is made conductive when receiving said coincident signal of said exclusive OR circuit; and

a gate circuit receiving at the input a signal carried on said common connection line of said first terminal and the output signal of said exclusive OR circuit and providing a coincident output signal when the data outputs are coincident between said counter and said memory device.

4,109,142

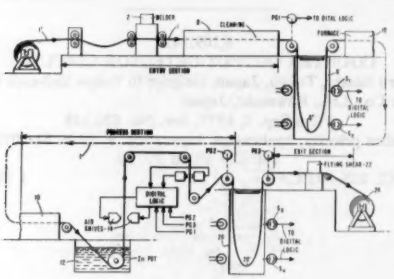
PROCESS DATA TRACKING SYSTEM

Gerald J. Readal, Pittsburgh; John R. Tiskus, and William J. Tomcanin, both of Monroeville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 29, 1974, Ser. No. 492,960

Int. Cl.[2] B21C *51/00*

U.S. Cl. 235—92 DN **8 Claims**



1. In a continuous strip processing line which includes means for variable strip storage, a method for tracking the accumulation of strip in said storage means comprising: incrementing a counter in response to signals representative of

incremental strip movements into the storage means; decrementing said counter in response to signals representative of incremental strip movement out of said storage means;

forcing the content of said counter to a predetermined reference

length in response in intermittent signals indicative of the existence of a known accumulation of strip in the storage means.

4,109,143

OPTICAL READER

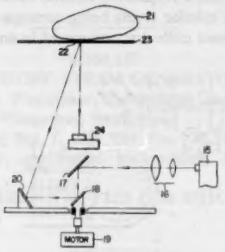
Tetsuo Yamaguchi; Toshihide Hane; Hidehiro Ochiai, and Shuzi Harada, all of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 18, 1976, Ser. No. 697,479

Int. Cl.[2] G06C *15/00*; G06K *7/10, 9/00*

U.S. Cl. 235—462 **1 Claim**

1. An optical reader system comprising an object to be read having at least two pieces of coded information thereon, with each piece of information having a unique control code associated with it, scan means for producing scanning light to be projected onto said object, photo-electric conversion means for converting scattered light produced by the scan and reflected from said object to an electrical signal, means for detecting said at least two pieces of coded information and associated control codes from said electrical signal and means for



sorting and storing said at least two pieces of coded information in accordance with said associated control codes.

4,109,144

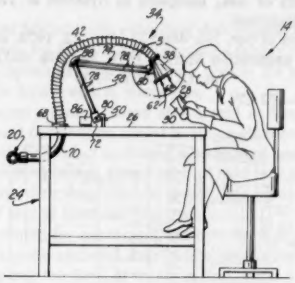
DUST COLLECTION AND ILLUMINATION SYSTEM

Albert J. Vidmar, Mentor, Ohio, assignor to Sherwood Refractories Inc., Cleveland, Ohio

Filed Aug. 11, 1975, Ser. No. 603,353

Int. Cl.[2] F21V *33/00*

U.S. Cl. 362—247 **12 Claims**

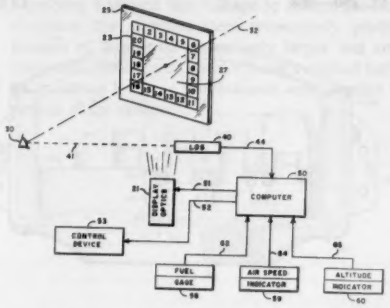


1. An apparatus for use in illuminating a work surface and removing dust particles from the area adjacent the work surface, said apparatus comprising a reflector having inner surface means for at least partially defining a light bulb receiving cavity having front and rear end portions and for reflecting light from the bulb toward the front end portion of the cavity, electrical socket means for supporting a light bulb in said cavity, a flexible conduit connected in fluid communication with the rear end portion of said cavity, blower means connected in fluid communication with said flexible conduit means for inducing a flow of air and dust particles from the area adjacent the work surface through said cavity and into said conduit means, rigid concuit means for connecting said flexible conduit means with said blower means, connector means connected with the work surface for connecting said flexible conduit means in fluid communication with said rigid conduit means, and support means connected with said reflector for supporting said reflector above the work surface, said support means being adjustable to flex said conduit and change the position of said reflector relative to the work surface.

4,109,145
APPARATUS BEING CONTROLLED BY MOVEMENT OF THE EYE

Carl P. Graf, Forrest Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 20, 1974, Ser. No. 471,409
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—201 8 Claims

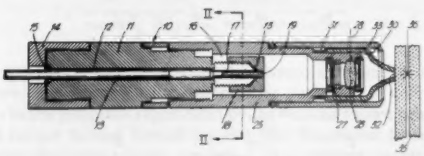


1. In combination:
a surface to be observed, including a display area and a plurality of trigger areas adjacent thereto which represent different control functions desired to be performed;
means continuously giving an output representing the location of the point of intersection of an observer's line of sight with said surface;
means deriving, from said output, signals indicative that the observer has fixated for a predetermined time period on any of said trigger areas;
and means for performing one of the control functions in accordance with said signals.

4,109,146
PRESSURE ACTUATED LIGHT PEN

Garth Decker Hillman, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 25, 1977, Ser. No. 790,430
Int. Cl.[2] G02B *5/14*
U.S. Cl. 250—227 6 Claims

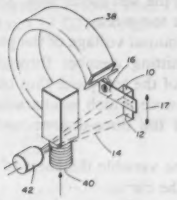


1. A pressure actuated light pen comprising:
a tubular body having front and rear parts;
means for connecting one end of an optical fibre bundle to said rear part, the end of said bundle at a predetermined position in said body;
a retractable tubular tip member mounted at said front part and axially slidable from an extended position to a retracted position;
an aperture at a forward end of said tip member;
resilient means urging said tip member to said extended position;
a lens system in said body positioned to image said aperture on the end of said fibre bundle, a light image at said aperture focussed on said end of said fibre bundle when said tip member is retracted to a predetermined position.

4,109,147
OPTICAL POSITION SENSOR

William Albert Heske, Fairfield, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 10, 1976, Ser. No. 684,610
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 P 24 Claims



1. Position sensing apparatus comprising in combination:
(a) a pair of spaced apart elements having radiation sensitive surfaces of predetermined active area, each of said elements being adapted to emit a discrete analog electrical signal of magnitude continuously correlated to its relative active surface area to which radiation is exposed;
(b) a radiation source for emitting radiation energy to which said elements are sensitive and positioned to project its emitted radiation in a uniform path toward the active surface areas of said elements;
(c) an opaque vane at an intermediate location between said source and said elements and transversely movable at least bidirectionally through an operating range in said radiation path for relatively varying the exposed active surface areas of said elements and said correlated signals emitted therefrom; and
(d) analog-digital circuit means operable to receive the correlated separate signals from each of said elements and to emit continuously a digital output signal correlated to the active surface area of said elements to which radiation is interrupted or uninterrupted at any given position throughout the operating range of said vane.

4,109,148
TRANSPARENT PLATES WITH A RADIOGRAPH THEREON AND PROCESS FOR THE PREPARATION THEREOF

Eric Jaulmes, Paris, France, assignor to Ateliers de la Motobecane, Pantin, France

Filed Mar. 10, 1977, Ser. No. 776,312
Claims priority, application France, Mar. 15, 1976, 76 07378
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—321 10 Claims

1. Process for obtaining a transparent plate whose transparency at every point is a function of the coordinates of this point, and wherein the function represents a voltage which is

obtained by placing a photocell on one side of the transparent plate and a light-emitting member on the other side of the plate opposite to the photocell, and the voltage is obtained at the exit of the photocell to form a curve characteristic of a three-dimensional form, comprising the steps of:

preparing at least one test-piece having a predetermined thickness of an X-ray absorbing material;

radiographing the test-piece with X-rays to form a radiograph of the test-piece;

recording the output voltage of the photocell illuminated by the light-emitting member through the support of the radiograph of the test-piece thus obtained;

forming the curve which is characteristic of the variable thickness of the three-dimensional form from the test-piece;

determining the variable thickness of the three-dimensional form from the curve;

forming the three dimensional form having a contour base homothetic to the surface of the transparent plate, the form having a thickness at every point substantially equal to the thickness of the test piece as measured from the base and corresponding to the voltage obtained at that point, the form being made from a material capable of absorbing X-rays; and

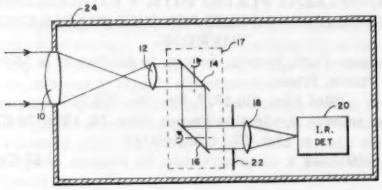
radiographing the three-dimensional form with X-rays to form a radiograph on the transparent plate, the transparent plate being the support of the radiograph thus obtained.

4,109,149

SHADE REDUCING APERTURE STOP FOR THERMAL IMAGING SYSTEMS

Irving R. Abel, Lexington, and Bruce R. Reynolds, Hudson, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 3, 1977, Ser. No. 802,996
Int. Cl.[2] G01J *1/00;* G02B *21/06*
U.S. Cl. 250—347 **9 Claims**



1. A thermal imaging system comprising:

telescope means for receiving thermal radiation from a scene;

scanning means for receiving thermal radiation from the telescope means and scanning the scene;

imaging lens means for imaging thermal radiation received from the scanning means at an image plane;

infrared detector means positioned proximate the image plane for producing output signals in response to the thermal radiation;

housing means for housing the telescope means, the scanning means, the imaging lens means, and the infrared detector means; and

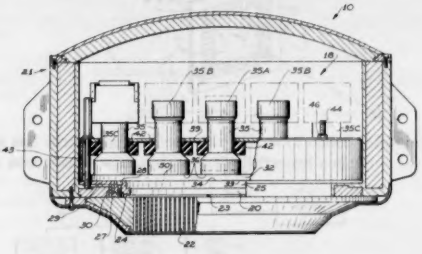
aperture stop means positioned proximate the imaging lens means for preventing thermal radiation from the housing means from being received by the infrared detector means.

4,109,150

SCINTILLATION CAMERA WITH THE SCINTILLATORS IN DIFFERENT PLANES

Ronald J. Martone, Cheshire; Samuel C. Goldman, Bethany, and Clifford C. Heaton, Meriden, all of Conn., assignors to Picker Corporation, Cleveland, Ohio

Division of Ser. No. 121,445, Mar. 5, 1971, abandoned. This application Sep. 13, 1973, Ser. No. 396,762
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—368 **12 Claims**



1. A scintillation camera comprising:

(a) an array of scintillation responsive devices including at least one centrally disposed scintillation responsive device surrounded by others of said scintillation responsive devices;

(b) light emitting means for emitting flashes of light to said scintillation responsive devices in response to incident radiation stimuli; and,

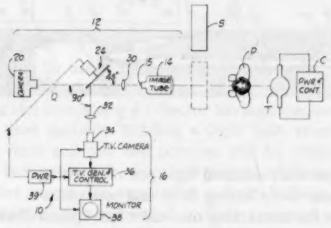
(c) certain of said scintillation responsive devices being positioned substantially within the same plane and a centrally disposed one of sqid scintillation responsive devices being positioned out of said plane.

4,109,151

DUAL FILAMENT X-RAY TUBE USED IN PRODUCTION OF FLUOROSCOPIC IMAGES

Viktor W. Pleil, Wheaton, Ill., assignor to Picker Corporation, Cleveland, Ohio

Continuation of Ser. No. 537,730, Dec. 31, 1974, abandoned. This application May 12, 1977, Ser. No. 796,064
Int. Cl.[2] G01N *23/22;* H01J *7/44*
U.S. Cl. 250—460 **7 Claims**



1. A method of operating an X-ray tube, the X-ray tube being used to produce fluoroscopic images in a system and of the type having a cathode structure including a pair of filaments for emitting electrons to an X-ray generating anode structure, the method comprising the steps of:

(a) energizing a selected one of the filaments while leaving the other filament de-energized to cause the energized filament to emit electrons;

(b) applying a voltage potential between the anode structure and the energized filament to produce a flow of electrons to the anode structure; and,

(c) applying a bias voltage potential between the energized filament and the cathode structure to control the flow of electrons to the anode structure between two X-ray producing operating levels, the step of applying including the alternate steps of:

(i) applying one bias voltage between the cathode structure and the electron emitter to allow a high flow of electrons; and,

(ii) applying a second bias voltage to reduce the flow of electrons, the alternate steps respectively producing streams of X-rays of respectively larger and smaller intensities, the electron emitter being switched between its operating levels in synchronism with another component of the system.

4,109,152

X-RAY INTENSIFYING SCREENS

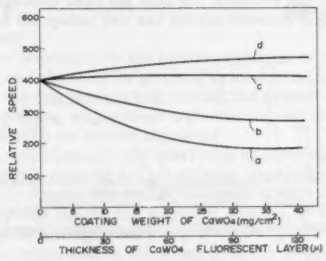
Yuji Aoki, Odawara; Keiji Shimiya, Hiratsuka; Norio Miura, Isehara; Etsuo Mori, and Yujiro Suzuki, both of Odawara, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Jul. 26, 1977, Ser. No. 819,043

Claims priority, application Japan, Aug. 13, 1976, 51-96846; Dec. 3, 1976, 51-145325

Int. Cl.[2] G01J *1/58*

U.S. Cl. 250—486 **12 Claims**



1. An X-ray intensifying screen comprising a support having formed thereon a first fluorescent layer composed of a complex halide phosphor represented by the formula shown below and further having formed on said first fluorescent layer a second fluorescent layer composed of a calcium tungstate phosphor:

$(Me_{1-\beta}Mg_{\beta})F_2.aMe'X_2.bKX'.cMe''SO_4:dEu^{2+},eTb^{3+}$

wherein Me, Me' and Me'' each represents at least one of the alkaline earth metals of the group consisting of barium, strontium and calcium; X and X' each represents at least one of chlorine and bromine; and *a, b, c, d, e* and *f* are numbers defined by one of the following five combinations

1. $0.80 \leqq a_1 \leqq 1.50$, $0.10 \leqq b_1 \leqq 1.50$, $c_1=0$, $0.001 \leqq d_1 \leqq 0.20$, $e_1=0$ and $f_1=0$;
2. $0.30 \leqq a_2 \leqq 1.50$, $0.10 \leqq b_2 \leqq 2.00$, $0.01 \leqq c_2 \leqq 1.00$, $0.001 \leqq d_2 \leqq 0.20$, $e_2=0$ and $f_2=0$;
3. $a_3=1$, $b_3=0$, $c_3=0$, $0.01 \leqq d_3 \leqq 0.10$, $0<e_3 \leqq 0.05$ and $f_3=0$;
4. $a_4=1$, $b_4=0$, $c_4=0$, $0.001 \leqq d_4 \leqq 0.20$, $e_4=0$ and $0<f_4 \leqq 1$; and
5. $a_5=1$, $0<b_5 \leqq 1.5$, $c_5=0$, $0.001 \leqq d_5 \leqq 0.20$, $e_5=0$ and $0<f_5 \leqq 1$.

4,109,153

VARIABLE-FLUENCE NEUTRON SOURCE

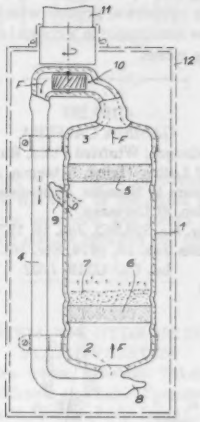
Guy Brachet, Breuillet; Pascal Demichel, Paris; Yvon Prigent, Marcoussis, and Jean Charles Riche, Draveil, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 9, 1976, Ser. No. 749,166

Claims priority, application France, Dec. 17, 1975, 75 38734

Int. Cl.[2] G21G *4/02*

U.S. Cl. 250—499 **8 Claims**



1. A variable-fluence neutron source utilizing a known reaction of the (a,n) type between a radioactive emitter and a target wherein the emitter is a powder within a closed chamber, a carrier fluid which constitutes the target, said powder in its normal quiescent bed state being sufficently compact so as to provide a self absorption of any generated radiation and means for fluidizing the powder emitter in said carrier fluid within said chamber by means for pumping said carrier fluid through a compact layer of the emitter powder for forming a fluidized suspension of the emitter powder from the layer in a homogeneous fluidized bed in said chamber to provide a neutron source of intensity varying with the pumping rate.

4,109,154

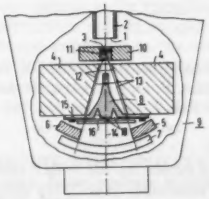
X-RAY BEAM COMPENSATION

Leonhard Taumann, Lafayette, Calif., assignor to Applied Radiation, Walnut Creek, Calif.

Filed Mar. 18, 1977, Ser. No. 779,025

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—503 **9 Claims**



1. An electron accelerator comprising:

(a) an electron beam;

(b) a target means exposed to the electron beam for producing x-ray deceleration radiation in the shape of a cone;

(c) a massive conical compensating means for flattening the radiation intensity distribution arranged centrally in the cone of the x-ray radiation, said compensating means

having a decreasing conical shape towards the target means, and a base away from the target means;

(d) said decreasing conical shape merging into a cylindrical portion having a frontal surface adjacent the target means; and

(e) a recess means positioned adjacent the base of the compensating means and having a given depth for compensating portions of the x-ray radiation in the cylindrical portion outwardly from the center of the radiation cone, said portions being those portions of the x-ray radiation intercepted by the cylindrical portion which are additional to those portions intercepted in a conical embodiment of the compensating means.

4,109,155

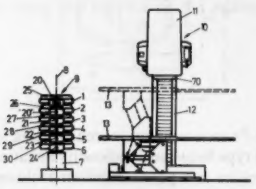
GAMMA CAMERA

Edgar Tschunt, Erlangen; Winfried Platz, Ratsberg; Ulrich Bär, Nuremberg, and Lothar Heinz, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 324,063, Jan. 16, 1973, abandoned. This application Jun. 14, 1974, Ser. No. 479,425

Int. Cl.[2] G21K *1/02*

U.S. Cl. 250—505 **4 Claims**



1. In combination with a gamma camera, a collimator exchangeably located in the ray inlet of the camera, a plurality of reserve collimators, and holders carrying said reserve collimators, a device for supporting said holders, said device comprising a column on the floor, and means connected with said column and supporting said holders swingably one above each other, a further column on the floor separated from the first-mentioned column and means swingably supporting the camera upon said further column, the column supporting the holders being located at such distance from the column supporting the camera that the swinging ranges of said holders and of said camera relatively to the centers of the collimators touch each other at least one location, and means providing for the exchange of a collimator between one of said holders when swung to said one location of its swinging range and the ray inlet of the camera when the camera has been swung about the further column to said one location of its swinging range.

4,109,156

COLLIMATING DEVICE FOR X-RAYS

Charles H. Schroeder, P. O. Box 9414, Raytown, Mo. 64133

Filed Feb. 7, 1977, Ser. No. 765,969

Int. Cl.[2] G21K *1/00*

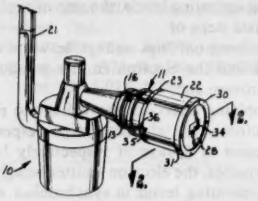
U.S. Cl. 250—505 **10 Claims**

1. A collimating device for use with a substantially tubular member which is attachable to an X-ray generator and which has an open end for providing an X-ray beam that may be used in intra-oral radiography, said collimating device comprising:

a substantially hollow member large enough to fit around the open end of said tubular member and having walls which are impervious to X-rays;

an end portion of said hollow member presenting a substantially rectangular opening through which X-rays may pass in a beam of substantially rectangular shape; and

means for detachably mounting said hollow member on the tubular member with said walls surrounding the open end



thereof and with said rectangular opening spaced a preselected distance from said open end.

4,109,157

APPARATUS FOR ION-NITRIDING

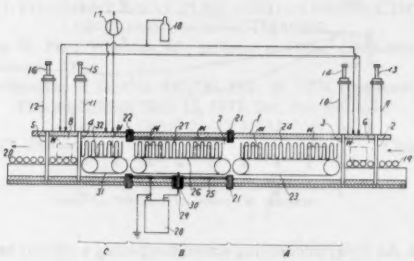
Akio Tanaka, Ono; Mizuo Edamura, Kobe; Satoshi Ruruitsu, Kakogawa, and Satoru Kunise, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 8, 1976, Ser. No. 748,453

Claims priority, application Japan, Dec. 18, 1975, 50/152086; Dec. 22, 1975, 50/174062[U]

Int. Cl.[2] B01K *1/00*

U.S. Cl. 250—531 **5 Claims**



1. An apparatus for ion-nitriding comprising:

(a) a vacuum chamber sectioned into a heating area having insulating chamber walls and a discharge nitriding area having electrically conductive chamber walls;

(b) a first transferring means disposed in said heating area for transferring a workpiece;

(c) heating means disposed in said heating area for pre-heating the workpiece up to the temperature at which the workpiece can be glow discharge nitrided;

(d) electrically conductive transferring means disposed in said discharge nitriding area for receiving the pre-heated workpiece from said first transferring means;

(e) heat-retaining means disposed in said discharge nitriding area for maintaining the pre-heated workpiece at a temperature suitable for glow discharge nitriding; and

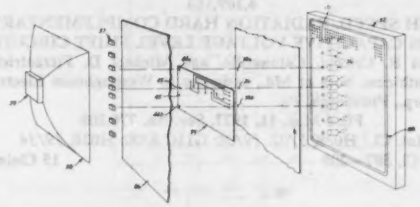
(f) discharge means to generate glow discharge between said conductive chamber wall of said discharge nitriding area as anode and said electrically conductive transferring means as cathode.

4,109,158

APPARATUS FOR POSITIONING A PAIR OF ELEMENTS INTO ALIGNED INTIMATE CONTACT

Frank Henning Blitchington, and George David Hudson, both of Richmond, Va., assignors to Western Electric Company, Inc., New York, N.Y.

Filed May 27, 1976, Ser. No. 691,043
Int. Cl.[2] G01N 21/30
U.S. Cl. 250—548 18 Claims



9. Apparatus for positioning a first element having a plurality of slots formed therein at selected locations into aligned intimate contact with a second element having a plurality of windows formed therein at selected locations alignable with the slots of the first element, which comprises:

means for adjustably supporting the second element with the plurality of windows being generally in a selected position;

means for moveably transporting the first element into a position spaced from and adjacent to the second element with the plurality of slots being thereby generally alignable with the plurality of windows;

means responsive to the general alignment of the plurality of slots of the first element with the plurality of windows of the second element for controlling movement of the transporting means and adjustment of the supporting means to accurately align the slots and windows and thereby position the spaced first and second elements in precise alignment;

means responsive to the precise alignment of the first and second elements for gripping at least an adjacent portion of the first element and moving the gripped portion into interfacing engagement with the second element while retaining the precise alignment;

means responsive to the interfacing engagement of the first element with the second element for forming an airtight enclosure and for sealing within the airtight enclosure at least the interfacing engaging portions of the first and second elements; and

means responsive to the forming of the airtight enclosure and acting upon the portions of the first and second elements within the airtight enclosure for urging the interfacing engaging portions into intimate contact in the precise alignment.

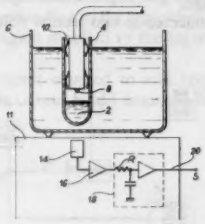
4,109,159

METHOD AND AN AUTOMATIC DEVICE FOR ANALYZING VARIATIONS IN THE TRANSPARENCY OF A SAMPLE

Michel Onillon, Vert le Grand; Pierre Roche, Maisons-Alfort, and Jean Thenard, Versailles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 24, 1977, Ser. No. 799,935
Claims priority, application France, Jun. 3, 1976, 76 16785
Int. Cl.[2] G01N 21/28
U.S. Cl. 250—564 11 Claims

5. A device for analyzing time-dependent variations in transparency of a sample in which said variations have a high-slope region followed by a low-slope region, wherein said device comprises means for generating a first signal B which is representative of the time-dependent variations of said transparency, means for generating a second signal A which is variable in time from an initial instant t_0, means for generating a first pulse at the initial instant t_0, means for generating the signal A, said means being provided with means for making said signal representative of the initial slope of the signal B at the beginning of its high-slope region, means for periodically comparing said



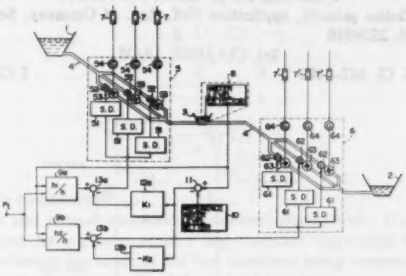
slope with the slope of the signal B, means for generating a second pulse when the slope of the signal B becomes higher than the initial slope measured, and means for measuring the time interval which elapses between the first and the second pulses.

4,109,160

CONTROL SYSTEM FOR HYDROELECTRIC POWER STATION SYSTEM

Masuo Goto; Akira Isono; Tunehiko Takakusagi; Masanobu Araki; Haruo Ishikawa, and Yukio Yamaguchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 11, 1976, Ser. No. 713,579
Claims priority, application Japan, Aug. 13, 1975, 50-97556
Int. Cl.[2] F15B 1/06
U.S. Cl. 290—52 15 Claims



1. A control system for hydroelectric power station system including three water reservoir means having different water levels and connected in cascade through water channels therebetween and power stations in the respective water channels, in which load instructions applied to said respective power stations are corrected according to the water level of said intermediate reservoir and the operating condition of said respective power stations.

4,109,161

MEMORY CIRCUIT WITH PROTECTION CIRCUIT

Hiroshi Iijima, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Feb. 8, 1977, Ser. No. 766,815
Claims priority, application Japan, Feb. 9, 1976, 51-13055
Int. Cl.[2] G11C 7/02
U.S. Cl. 307—87 3 Claims

1. A memory circuit with a protection circuit, comprising:

a memory circuit having first and second voltage input terminals to which first and second voltages are supplied,

said memory circuit operating in response to said first and second voltages, said memory circuit comprising a plurality of MOS-IC memory elements whose substrate input terminals are connected in series to be supplied with said second voltage and whose main voltage terminals are connected to each other to be supplied in parallel with said first voltage,

a comparator connected to said second voltage input terminal and generating a control signal when the voltage at said second voltage input terminal is below a given level; and

a switching circuit connected between said first voltage input terminal and said memory circuit and responsive to said comparator for cutting off said first voltage when said control signal is generated, whereby said switching circuit may be opened when a voltage at said second voltage input terminal falls below said given level.

4,109,162

MULTI-STAGE INTEGRATED INJECTION LOGIC CIRCUIT WITH CURRENT MIRROR

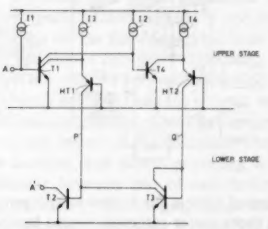
Rolf Heuser, Ellerau, Fed. Rep. of Germany, and George Albert Govaert, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,194

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1975, 2538910

Int. Cl.[2] H03K *19/08*

U.S. Cl. 307—203 **5 Claims**



1. A circuit comprising

a voltage supply terminals;

a plurality of circuit stages including a first upper stage and a second lower stage connected in series across the voltage supply terminals;

Said first upper stage including a first switching transistor of the first conductivity type having an emitter, a base and one or more collectors;

a first auxiliary transistor of the second conductivity type having an emitter, a base and a collector; a first signal input and a current injector being connected to said base of said first switching transistor; a collector of said first switching transistor being connected to the emitter of said first auxiliary transistor; the emitter of said first switching transistor and the base of said first auxiliary transistor being connected together;

said second lower stage including a second switching transistor of the first conductivity type having an emitter, a base and a collector; the collector of said first auxiliary transistor being connected to the base of said second switching transistor; and current mirror means connected to the base and the emitter of said second switching transistor which functions to drain charge therefrom when the latter is turned off; the collector of said second switching transistor being connected to a signal output.

4,109,163

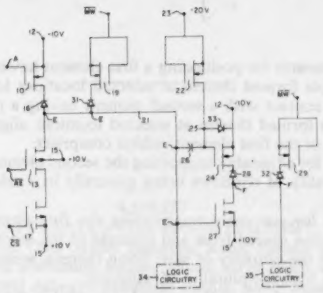
HIGH SPEED, RADIATION HARD COMPLEMENTARY MOS CAPACITIVE VOLTAGE LEVEL SHIFT CIRCUIT

James R. Cricchi, Catonsville, and Michael D. Fitzpatrick, Linthicum, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 11, 1977, Ser. No. 776,805

Int. Cl.[2] H03K *5/02, 19/08;* G11C *8/00;* H03K *19/34*

U.S. Cl. 307—205 **15 Claims**



1. A complementary MOS voltage level shift circuit comprising:

an input stage having a plurality of MOS transistor inputs and an output, said input stage operative to generate, in response to a sequence of input signals applied to said transistor inputs, a first voltage swing of a first predetermined amount between a positive voltage potential and a first negative voltage potential, said input stage having a first section including a first N-channel depletion mode MOS transistor coupled to said first negative voltage potential and a second section including a first P-channel enhancement mode MOS transistor coupled to said positive potential;

a first voltage potential limiting means coupling said first and second sections and coupled to the output of said input stage;

a voltage level shift stage having an input, said input coupled to the output of said input stage, said shift stage including two MOS transistors operatively coupled in a push-pull configuration to alternately turn ON and OFF in a coordinated manner in response to said first voltage swing to generate a second voltage swing of a second predetermined amount greater than the first predetermined amount of said first voltage swing;

DC blocking means coupling one of the transistors in said shift stage to the input of said shift stage.

4,109,164

CIRCUITRY FOR GENERATING RAMP TYPE SIGNALS

LaVerne A. Caron, Rochester, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 28, 1977, Ser. No. 772,604

Int. Cl.[2] H03K *4/08, 3/78*

U.S. Cl. 307—228 **8 Claims**

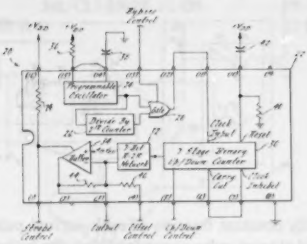
1. A circuit comprising:

an input terminal for receiving a repetitive input signal;

an output terminal;

means including a counter circuit coupled to said input terminal for registering in its count occurrences of said input signal and providing an analog signal whose magnitude is representative of its count;

an output buffer stage receiving said analog signal and providing a corresponding output signal, and control circuitry coupled with said output stage, said control circuitry comprising,



offset control means for offsetting the output signal of said buffer stage in accordance with an offset control signal,

and, strobe control means providing for selective transmission of the output signal of said buffer stage to said output terminal in accordance with a strobe control signal.

4,109,165

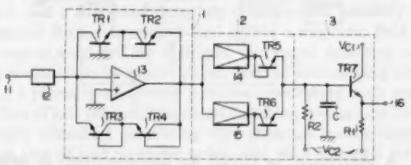
RMS CIRCUIT

Masayuki Katakura, Yokohama, and Hisashi Yamada, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki Japan

Filed Feb. 14, 1977, Ser. No. 768,367

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—229 **4 Claims**



1. An RMS circuit comprising:

a logarithmic amplifying circuit including an operational amplifier provided with a signal input terminal and an output terminal,

a first feedback circuit for the feedback of one of the positive and negative components of the input signal formed of first and second *npn* transistors whose emitter-collector paths are connected in series between the input and output terminals of the operational amplifier,

the base and collector of the second *npn* transistor being connected together,

a second feedback circuit for the feedback of the other of the positive and negative components of the input signal formed of third and fourth *npn* transistors whose emitter-collector paths are connected in series between the input and output terminals of the operational amplifier,

the base and collector of each of the third and fourth *npn* transistors being connected together,

the first feedback circuit and operational amplifier being combined to form a first logarithmic amplifying section,

the second feedback circuit and operational amplifier being combined to form a second logarithmic amplifying section,

a fullwave rectifying circuit coupled to said output terminal for subjecting an output signal from the logarithmic amplifying circuit to fullwave rectification,

the fullwave rectifying circuit being connected to receive a signal from the logarithmic amplifying circuit corresponding to twice the logarithmic value of an input signal supplied to the logarithmic amplifying circuit and to produce a signal corresponding to the logarithmic value of a square of an input signal supplied to the logarithmic amplifying circuit, and

a smoothing circuit coupled to said rectifying circuit for smoothing an output signal from the fullwave rectifying circuit.

4,109,166

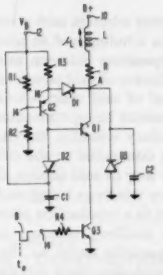
CLAMPING CIRCUIT

Charles Albert Clark, Jr., Chatsworth, and Kenneth Charles Adam, Thousand Oaks, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 788,035

Int. Cl.[2] H03K *5/08*

U.S. Cl. 307—237 **12 Claims**



1. In combination:

first and second transistors of opposite conductivity types, each having base, emitter and collector electrodes, the collector electrode of the first transistor being connected to the base electrode of the second transistor;

means for maintaining the base electrode of the first transistor at a fixed potential with respect to ground, which is in the forward direction relative to the potential at the emitter electrode of said first transistor during the clamping of the collector electrode of said second transistor described below;

means for supplying emitter current to said first transistor, thereby conditioning said first transistor to supply its collector current as base drive current for said second transistor;

means coupled between the emitter and collector electrodes of said second transistor for conditioning said second transistor to conduct collector-to-emitter current; and

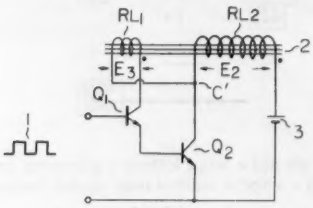
clamping means connected between said emitter electrode of said first transistor and said collector electrode of said second transistor which is poled to conduct in the forward direction during conduction of current through the collector electrode-to-emitter electrode path of said second transistor for clamping the collector electrode of said second transistor to a voltage related to that at the base electrode of said first transistor.

4,109,167

TRANSISTOR AMPLIFIER APPLYING LARGE OUTPUT CURRENTS TO A LOAD

Isamu Kaji, 48-38, Yamashina-Higashino-Yashiro, Higashiyama-ku, Kyoto, and Naoyuki Maeda, 671-1, Aza Higashikoken, Oaza Inuyama, Inuyama-shi, Aichi-ken, both of Japan

Filed Dec. 28, 1976, Ser. No. 754,954
Claims priority, application Japan, May 21, 1976, 51-58841
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—270 9 Claims



1. In a circuit arrangement wherein a load is connected across a secondary winding of an output transformer having primary winding means wound on a core in series with a source of direct current and an amplifier consisting of a plurality of transistors comprising a driving transistor and a power transistor in a Darlington configuration, each of said transistors including an emitter, a collector and a base, the emitter of said driving transistor being tied to the base of said power transistor,

the improvement wherein said primary winding means comprises a main winding and an ancillary winding connected in series opposition between said source and said amplifier, the collector of said power transistor being connected to a terminal of said main winding, the collector of said driving transistor being connected to said terminal by way of said ancillary winding, the emitter of said power transistor being connected to the other terminal of said main winding by way of said source, the turn ratio of said main and ancillary windings being such that said power transistor saturates in a conduction phase, the voltage developed across said ancillary winding in said conduction phase being substantially equal to the difference between the voltage across the main winding added to the source voltage and the combined collector/emitter voltage of said driving transistor and base/emitter voltage of said power transistor.

4,109,168

CURRENT-TO-FREQUENCY CONVERTER

David Lee Raymond, Arcadia, Calif., assignor to Analog Technology Corporation, Irwindale, Calif.

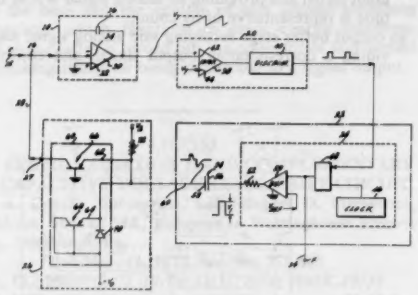
Filed Jan. 19, 1977, Ser. No. 760,686
Int. Cl.[2] H03K *1/16*
U.S. Cl. 307—271 23 Claims

1. A circuit for generating a current pulse containing an accurately-determined minute quantity of electrical charge, comprising:

a current pulse generator for generating, in response to an input signal, an output current pulse containing a precise, pre-determined quantity of electrical charge; and

a current divider connected to said current pulse generator for dividing each current pulse supplied by said current pulse generator and having an output terminal at which a small constant fraction of each current pulse is presented,

said current divider further comprising a pair of transistors connected in parallel to receive each current pulse, one of said transistors providing a conductive path to the output terminal and the other of said transistors providing a conductive shunt path for each current pulse, said transistors being biased to operate at different operating points of their characteristics, at which the conductances of the transistors are in a predetermined ratio, a small substantially constant fraction of each current pulse supplied by said current pulse generator being conducted through said one of said transistors to the output terminal.

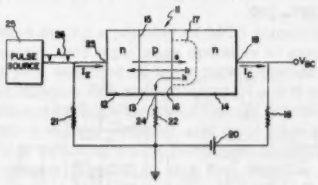


4,109,169

AVALANCHE MEMORY TRIODE AND LOGIC CIRCUITS

Wirojana Tantraporn, and Se Puan Yu, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,543
Int. Cl.[2] H03K *17/00*; H01L *29/88*
U.S. Cl. 307—302 20 Claims



1. A semiconductor circuit for use selectively in memory and logic applications comprising

a controlled avalanche memory triode operable at microwave frequencies and comprising contiguous emitter, base, and collector regions each having a terminal and defining emitter-base and base-collector junctions, said emitter and collector regions being of one conductivity type and said base region being of the other conductivity type, said collector region further having an avalanche zone of limited lateral extent,

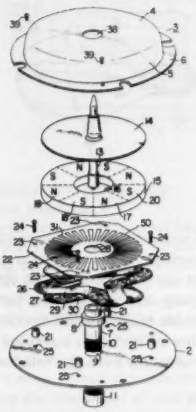
bias means for applying a reverse bias voltage to said base-collector junction sufficient to cause low ratio avalanche multiplication of charge carriers injected into said collector region, and

pulse source means for supplying input signals with a predetermined interval therebetween effectively in circuit between said emitter and base terminals, one input signal having a polarity to forward-bias said emitter-base junction while the succeeding input signal has a polarity to reverse-bias said emitter-base junction, said one input signal functioning to switch a selected circuit parameter at one of said terminals from a first to a second magnitude which persists until the application of the succeeding input signal switches the selected circuit parameter back to said first magnitude.

4,109,170
ELECTRIC MOTOR HAVING FREQUENCY GENERATOR

Masahiko Fujita; Toshihiko Gotoh, both of Yokohama, and Hiroshi Hagino, Omiya, all of Japan, assignors to Hitachi, Ltd. and Japan Servo Co., Ltd., both of, Japan

Filed Oct. 19, 1976, Ser. No. 733,779
Claims priority, application Japan, Oct. 22, 1975, 50-126441
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 R 13 Claims



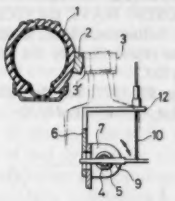
1. An electric motor incorporating a frequency generator comprising a rotary shaft, a disk-shaped multipolar magnet having a plurality of magnetizable sectors, said sectors being magnetized to exhibit poles of different polarities at both thicknesswise ends, adjacent ones of said sectors being poles of reverse polarities, a pair of flat driving coils disposed parallely with and spaced from said magnet and within a field of said magnet, and a flat speed detecting coil disposed parallely on and spaced from said magnet and within a magnetic field of said magnet, said driving coils and said speed detecting coil being arranged to be nonrotatable, each of said driving coils having a plurality of driving portions interlinking with magnetic flux of said magnet, said speed detecting coil having $2n + 1$ radially extending generating wire elements corresponding to each one of said magnetic poles, said wire elements being serially connected, whereby said speed detecting coil acts as a frequency generator producing a signal having a frequency corresponding to a revolution speed of said magnet, when said driving coils are supplied with electrical power.

4,109,171
DEVICE FOR INDICATING THE DIRECTION OF DRIVING OF A VEHICLE

Yoshikatsu Furusawa, No. 19, Aza Uwamichi, Kemanai Towada-machi, Kazuno-shi, Akita-ken, Japan

Filed Feb. 11, 1977, Ser. No. 767,763
Claims priority, application Japan, Dec. 15, 1976, 51-151373
Int. Cl.[2] H02K *7/00*
U.S. Cl. 310—75 C 4 Claims

1. In a device for emitting a signal in a driven vehicle such as a bicycle, said device including a miniature power generator employed for producing electric power and for emitting said signal in such a manner that the rotor of said miniature generator is driven by the rotation of the wheel of the vehicle by tilting the miniature generator to a position at which said rotary head of said miniature generator contacts at least a portion of said wheel, the improvement wherein said rotary head of said miniature generator contacts a strip of rubber-like substance fixed to the side surface of a wheel tire made of a rubber-like substance, said strip covering only a segment of the circumference of said tire and projecting sideways to permit

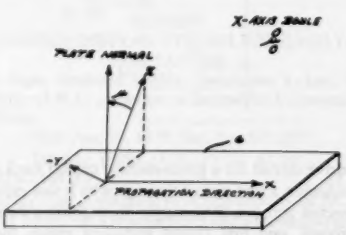


contact with said rotary head of said miniature power generator.

4,109,172
HIGH PIEZOELECTRIC COUPLING-TEMPERATURE COMPENSATED BERLINITE SUBSTRATE MEMBER FOR SURFACE ACOUSTIC WAVE DEVICES

Robert M. O'Connell, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1977, Ser. No. 826,107
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—313 1 Claim



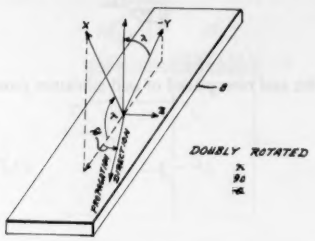
1. A surface acoustic wave device substrate member of single crystal berlinite having an acoustic surrface wave propagation surface defined by a plane that substantially coincides with the Euler angles Lambda = 0.0°, mu = 80.4°, and Theta = 0.0°.

4,109,173

HIGH PIEZOELECTRIC COUPLING, LOW DIFFRACTION LOSS, TEMPERATURE COMPENSATED BERLINITE SUBSTRATE MEMBERS FOR SURFACE ACOUSTIC WAVE DEVICES

Robert M. O'Connell, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1977, Ser. No. 826,108
Int. Cl.[2] H01L 41/10
U.S. Cl. 310—313 2 Claims



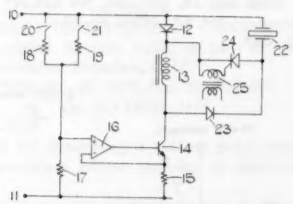
1. A surface acoustic wave device substrate member of single crystal berlinite having an acoustic surface wave propagation surface that substantially coincides with the Euler angles Lambda = 76.8°, μ = 90.0°, and Theta = 11.5°.

4,109,174

DRIVE CIRCUITS FOR A PIEZOELECTRIC STACK

Duncan Barry Hodgson, Whitnash near Leamington Spa, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 4, 1977, Ser. No. 765,645
Claims priority, application United Kingdom, Feb. 24, 1976, 7157/76
Int. Cl.[2] H01L 41/10
U.S. Cl. 310—316 16 Claims



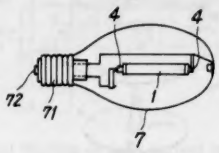
1. A drive circuit for a piezo-electric crystal stack comprising an inductor, a first circuit through which said inductor can be connected across a D.C. supply to establish a current flow therethrough, said first circuit including means for rapidly reducing the current flowing to the inductor from the source of supply, a second circuit through which energy is transferred to said crystal stack from the inductor when the current flowing from the source of supply is reduced, and means for transferring energy to the inductor from the crystal stack when it is required to increase the current flow in the inductor.

4,109,175

HIGH PRESSURE SODIUM VAPOR DISCHARGE LAMP

Yoshiaki Watarai, Takatsuki; Haruo Yamazaki, Moriyama; Naoki Saito; Masayuki Yamaguchi, both of Takatsuki; Takio Okamoto, Kusatsu, and Hidezo Akutsu, Kobe, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Mar. 14, 1977, Ser. No. 777,149
Claims priority, application Japan, Mar. 19, 1976, 51-30190; Sep. 20, 1976, 51-113429; Sep. 20, 1976, 51-113432
Int. Cl.[2] H01J 61/18
U.S. Cl. 313—112 11 Claims



1. A high pressure sodium vapor discharge lamp comprising an alumina tube envelope containing therein sodium, inert starting gas, a buffer gas source being at least one member selected from the group consisting of mercury and cadmium and discharge electrodes sealed in the envelope, in which an inner diameter d in nm of said tube envelope and an average potential gradient E in v/cm have the relation

$$E \geq 37.7 - 2.05d,$$

and said lamp further comprising

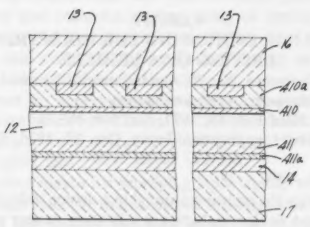
a radiation suppressing means for selectively absorbing radiation of wave length longer than 620 nm, said radiation suppressing means being formed at least partly to surround said tube envelope.

4,109,176

INSULATING DIELECTRIC FOR GAS DISCHARGE DEVICE

Roger E. Ernsthausen, Luckey; Michael E. Fein, and Bernard W. Byrum, Jr., both of Toledo, all of Ohio, assignors to Owen-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 291,956, Sep. 25, 1972, abandoned, which is a division of Ser. No. 217,395, Jan. 12, 1972, abandoned. This application Jun. 16, 1975, Ser. No. 587,499
Int. Cl.[2] H01J 61/30, 61/35
U.S. Cl. 313—220 38 Claims

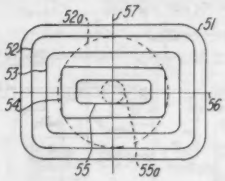


1. In a gas discharge device containing at least two electrodes, at least one of the electrodes being insulated from the gas by a dielectric member, the improvement wherein at least one dielectric member contains an electrically non-conductive insulating source of at least one element selected from copper, silver, cadmium, mercury, and zinc.

4,109,177
CATHODE-RAY TUBE HAVING APERTURED MASK

Richard Hugh Godfrey, and Albert Maxwell Morrell, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 22, 1971, Ser. No. 165,098
Int. Cl.[2] H01J 29/07, 29/32
U.S. Cl. 313—402 16 Claims

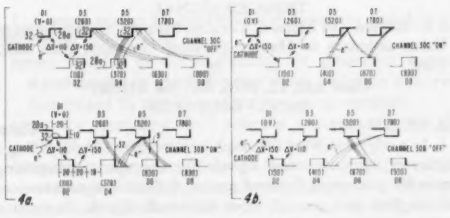


1. In a cathode-ray tube comprising:
(1) an evacuated envelope,
(2) a luminescent viewing screen within said envelope, said viewing screen comprising a plurality of different color light-emitting areas arranged in repetitive order,
(3) means for projecting a plurality of electron beams toward said screen for exciting said screen to luminescence, said plurality of beams being equal in number to said plurality of different colors,
(4) and means including an apertured mask closely spaced from said viewing screen for selectively defining to the viewer during the operation of said tube an array of discrete excited luminescent areas in said screen, which areas are graded in size with the largest areas being in the central portion of the screen and the smallest areas being in the peripheral portions of the screen,
the improvement wherein defined areas of equal size are located on one of a family of closed noncircular curves, each curve having a major horizontal axis and a minor vertical axis intersecting at about the center of said screen and being generally symmetrical about said axes.

4,109,178
ELECTRON MULTIPLIER WITH SWITCHABLE BEAM CONFINEMENT STRUCTURE

Carmen Anthony Catanese, Rocky Hill; John Guiry Endriz, and Scott Allen Keneman, both of Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 5, 1977, Ser. No. 794,132
Int. Cl.[2] H01J 29/41
U.S. Cl. 315—12 R 19 Claims

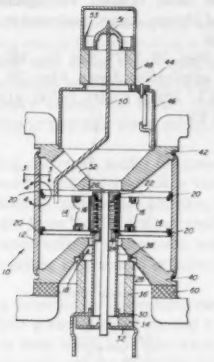


1. An electron multiplier, comprising:
at least two spaced substrates of electrically insulating material;
a cathode at one end of said substrate;
a plurality of parallel dynodes on the surfaces of said substrates which face each other; said dynodes on one of said surfaces being in staggered relation to said dynodes on the other of said surfaces with at least some of said dynodes including a nonplanar structure periodically along the length thereof, said nonplanar structure forming a plurality of substantially parallel spaced channels, said channels extending from said cathode and traversing said parallel dynodes; and
means responsive to a first set of discrete electrical potentials applied to separate ones of said dynodes for establishing a relatively high electron multiplier gain condition in at least one of said channels while simultaneously establishing a relatively low electron multiplier gain condition in channels adjacent thereto, said means being responsive to a second set of discrete electrical potentials applied to separate ones of said dynodes for establishing a relatively low electron multiplier gain condition in said one channel while simultaneously establishing a relatively high electron multiplier gain condition in said adjacent channels.

4,109,179
MICROWAVE TUBE ASSEMBLY

John J. McKinnon, East Falmouth, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1977, Ser. No. 756,301
Int. Cl.[2] H01J 25/587
U.S. Cl. 315—39.75 10 Claims



1. A microwave magnetron comprising:
an anode cylinder having end walls connected thereto;
a plurality of anode vanes extending inwardly from the interior surface of said anode cylinder spaced from said end walls; and
a plurality of retainer rings formed into recesses in said vanes and said rings urging said anode vanes against said inner surface of said anode cylinder.

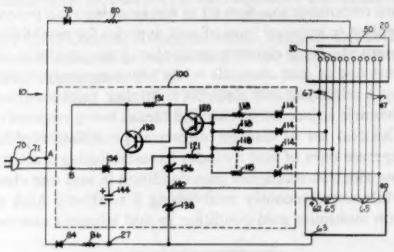
4,109,180
AC-POWERED DISPLAY SYSTEM WITH VOLTAGE LIMITATION

James A. Ogle, Neshanic Station, and James Y. Lee, Kendall Park, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 23, 1977, Ser. No. 809,357
Int. Cl.[2] H05B 37/00, 39/00, 41/00
U.S. Cl. 315—169 TV 11 Claims

1. A display system which is to be powered by an AC power supply, and which has a first terminal and a second terminal for receiving the AC signal, comprising:
(a) a gas discharge display panel having an anode and a plurality of cathodes, said anode being connected to said first terminal;
(b) circuit means connected to said cathodes for energizing selected ones of said cathodes; and
(c) voltage limiting means connected to said second terminal

and to said circuit means for limiting the amount of current flowing through said display system in response to



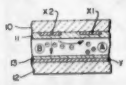
the voltage across said circuit means, to thereby limit the voltage across the circuit means to a preselected level.

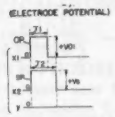
4,109,181

DRIVING SYSTEM AND METHOD FOR SHIFTING A DISCHARGE SPOT IN A PLASMA DISPLAY PANEL

Kenji Murase; Sei Sato; Hisashi Yamaguchi, and Hirofumi Kashiwara, all of Hyogo, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 29, 1977, Ser. No. 782,454
Claims priority, application Japan, Mar. 29, 1976, 51-34626
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **36 Claims**





1. A method of shifting a discharge spot in an A.C. type gas discharge panel having at least one common electrode covered by a dielectric material and disposed on a first substrate and at least first and second further electrodes spaced from each other disposed on a second substrate to face to said common electrode and covered by a corresponding dielectric surface, said dielectric surfaces of said common electrode and said further electrodes being spaced from each other to define therebetween a gas discharge space with said first and second further electrodes facing said common electrode across said discharge space to define corresponding first and second adjacent gas discharge cells, comprising the steps of:

establishing a discharge spot in said first cell,

applying a priming discharge pulse of a given polarity and first predetermined duration to said first further electrode to produce a priming discharge in said corresponding first cell with respect to said adjacent second cell,

applying a shift pulse of said given polarity to said second further electrode of a second, longer duration than said first predetermined duration, and

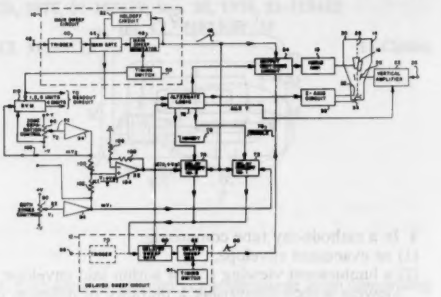
terminating said priming discharge pulse prior to termination of said shift pulse, said shift pulse thereby producing a lateral field between said first and second cells for transferring to said second cell components of the priming discharge of said first cell, thereby to facilitate the initiation of a discharge at said second cell for shifting said discharge spot to said second cell.

4,109,182

DELAYED SWEEP SYSTEM FOR AN OSCILLOSCOPE

Oliver Dalton, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 532,089, Dec. 12, 1974. This application Mar. 10, 1976, Ser. No. 665,645
Int. Cl.[2] G01R *13/28*
U.S. Cl. 315—392 **4 Claims**



1. In an oscilloscope for displaying an input waveform, said oscilloscope including a cathode-ray tube provided with deflection means, a dual delayed time base system comprising:

a first base generator triggered in time relation with said input waveform to produce a main sweep waveform, said first time base generator including means for adjusting the sweep rate of said main sweep waveform;

means for generating first and second selectable voltage levels;

comparator means for comparing said main sweep waveform to said first and second voltage levels so that first and second trigger pulses are generated in accordance therewith;

a second time base generator triggered in timed relation with said first and second trigger pulses to produce a delayed sweep waveform, said second time base generator including means for adjusting the sweep rate of said delayed sweep waveform; and

logic circuit means for alternately enabling and inhibiting said first and second voltage levels so that said comparator means generates said first trigger pulse during the generation of a main sweep waveform and said second trigger pulse during the generation of the next succeeding main sweep waveform.

4,109,183

THIRD CHANNEL OSCILLOSCOPE DISPLAY FOR TRIGGER SIGNAL

Joe K. Millard, and Eldon C. Cornish, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 12, 1976, Ser. No. 675,667
Int. Cl.[2] G01R *13/28*
U.S. Cl. 315—392 **1 Claim**

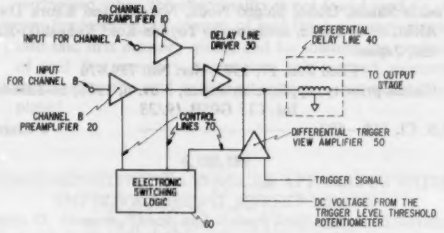
1. In a triggerable oscillographic instrument for providing a display of input electrical signals, the instrument comprising means for generating first and second deflection signals responsive to first and second input electrical signals, horizontal sweep means responsive to an output of a trigger threshold detector which compares a trigger signal to a selectable trigger level threshold, and means for generating a third vertical deflection signal in response to said trigger signal, the improvement comprising:

means for generating a clock signal;

first and second flip-flops, each having a clock input coupled to receive the clock signal, each having complementary first and second outputs, each having a data input, the data input of said second flip-flop coupled to the first output of said first flip-flop;

a first NAND gate responsive to the first outputs of said first and second flip-flops and with the output thereof coupled to the data input of said first flip-flop;

means for selectively disabling the second flip-flop and presetting the first output therefrom to a predetermined voltage; and



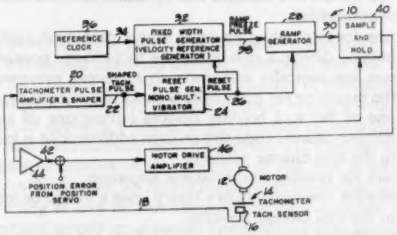
means for enabling and disabling said means for generating first, second and third deflection signals in response to the output of said first NAND gate, the second output of said first flip-flop, and the second output of said second flip-flop respectively.

4,109,184

METHOD AND APPARATUS FOR PROVIDING A STABLE, HIGH GAIN SERVO SYSTEM

Donald William Weber, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,667
Int. Cl.[2] H02P *5/00*
U.S. Cl. 318—327 **14 Claims**



1. A servo system for controlling an operating variable of a mechanism, comprising:

means coupled to the mechanism for generating a ramp signal having an amplitude that varies with time to a level determined by the state of the operating variable;

means for generating clock pulses at a rate greater than the rate of occurrence of said ramp signal;

ramp interrupt means coupled to the ramp signal generating means and the clock pulse generating means for interrupting the amplitude variation of the ramp signal upon the occurrence of a clock pulse following the initiation of the ramp signal to maintain said ramp amplitude constant for a period corresponding to a predetermined number of clock pulses and for recommencing the ramp signal's amplitude variation with time at the end of the period; and

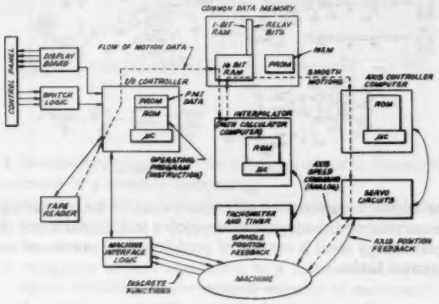
means coupled to the ramp signal generating means for detecting the recommenced ramp signal to initiate the generation of a drive signal for controlling the operating variable of the mechanism in accordance with the detected ramp signal.

4,109,185

SERVO SYSTEM EMPLOYING DIGITAL COMPONENTS

Stanley G. Froyd, San Marino; Raymond C. Ue, Monterey Park, and John Paul Buchanan, Monrovia, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 27, 1976, Ser. No. 754,909
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—571 **20 Claims**



1. A control system for a rotating axis comprising

digital counting means for generating a continuous series of binary counts, each count comprising a plurality of bits,

means for converting said series of binary counts into two series of binary words, the binary value of said words corresponding to two sine wave values ninety degrees out of phase

digital to analog converter means for converting each series of binary words into corresponding voltage levels,

a resolver rotatably coupled to said axis, for receiving said voltage levels from said digital to analog converters for use as reference voltage sine waves, and for outputting a sine wave varying in phase in relation to the rotation of said axis,

a zero crossing detector for converting each resolver output sine wave into a binary pulse having a changing state at each point in time when said sine wave crosses zero,

latch means responsive to the changing state of said detector pulse for storing said digital counting means count at the time when said detector pulse changes state, said count being a digital signal representation of said axis actual position,

input means for generating a digital signal corresponding to a commanded position of said axis,

summing junction means for subtracting said actual position digital signal from said commanded position digital signal to produce a velocity error signal, and

an axis drive means for rotating said axis at a rate proportional to the value of said velocity error signal.

4,109,186

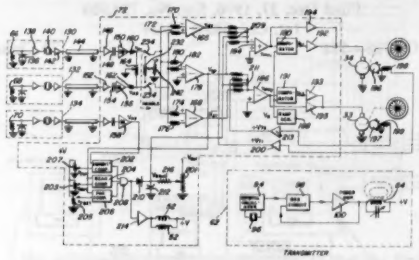
SELF-PROPELLED GOLF CART

Anthony Farque, Fayetteville, Ark., assignor to Gettig Engineering & Manufacturing Co., Inc., Spring Mills, Pa.

Division of Ser. No. 461,809, Apr. 17, 1974, Pat. No. 3,976,151, which is a division of Ser. No. 166,051, Jul. 26, 1971, Pat. No. 3,812,929. This application Aug. 23, 1976, Ser. No. 716,762
Int. Cl.[2] B60K *27/06;* **B62D** *11/02*
U.S. Cl. 318—587 **8 Claims**

1. A guidance and speed control system controlled by a distance signal originating from a control point, comprising a plurality of substantially spaced signal receivers adapted to simultaneously receive said distance signal at different energy levels determined by their relative spacing from said control point, speed control means comprising amplifier means connected to said receivers and adapted to generate a signal by summing the signal energy levels from two of the said receiv-

ers for generating a speed control signal, direction control means comprising two directional amplifier means responsive to the difference between the signal energy levels from said two receivers for generating directional control signals, and



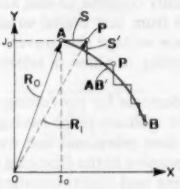
gate means connected to said speed control means through comparator means adapted to develop a stop signal when the signal energy level is outside of predetermined maximum and minimum limits.

4,109,187

CONTOUR CONTROL SYSTEM INCLUDING CUTTER RADIUS COMPENSATION

Walter A. Steinberg, Huntington Station, and Howard E. Parker, Syosset, both of N.Y., assignors to Autonumerics, Inc., Hauppage, N.Y.

Filed Sep. 22, 1975, Ser. No. 615,361
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—572 **23 Claims**



1. A control system for controlling movement of a machining means relative to a workpiece support means in accordance with a set of predetermined input instructions corresponding to a prescribed path of movement in at least two directions with respect to a common origin, wherein X and Y, respectively, represent the total excursions in said two directions, I and J represent coordinates of one end of a main contour vector along said X and Y excursions, respectively, said main contour vector having its other end coincident with said common origin, and *i* and *j* represent the lengths of components, along said X and Y excursions, respectively, of one end of a sub-contour vector having its other end coincident with said one end of said main contour vector, said control system comprising:

main contour logic means for generating output signals for controlling the relative movement of said machining and support means in at least one of the X and Y directions as a function of the relative magnitudes of I and J and the algebraic sign of a main contour error determined from the values of I and J;

sub-contour logic means for generating output signals for controlling said relative movement in at least one of the X and Y directions as a function of the relative magnitudes of *i* and *j* and the algebraic sign of a sub-contour error determined from the values of *i* and *j*;

cross-error logic means for determining the algebraic sign of a cross-error $E = Ij - iJ$; and

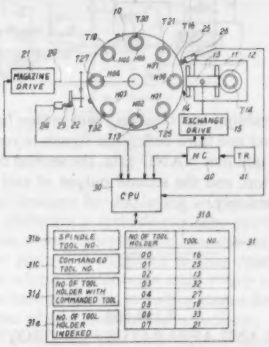
cutter compensation control logic means coupled to said main contour control logic means, said sub-contour control logic means, and said cross-error logic means for selectively enabling one or the other of said main and sub-contour control logic means depending on the algebraic sign of said cross-error.

4,109,188

INDEX DEVICE FOR TOOL STORAGE MAGAZINE

Yoshio Shima, Ohbu; Shigeo Noda, Nagoya, and Kaoru Owa, Aichi, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed Jan. 17, 1977, Ser. No. 759,676
Claims priority, application Japan, Nov. 6, 1976, 51-133644
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—602 **6 Claims**



1. An index device for indexing a rotatable magazine, having a plurality of tool holding devices which store a variety of tools and are addressed in a numerical order, to a predetermined tool change position for a tool exchange operation between a tool indexed at the tool change position and a tool held in a spindle of a machine tool by means of a tool exchange device comprising:

means for generating an index signal each time each tool holding device is indexed to the tool change position;

means mechanically responsive to rotational movement of the magazine for generating a check signal each time any one of the tool holding devices having one of an odd number address code and an even address code is indexed to the tool change position;

means for rotating said rotatable magazine;

means for commanding in a binary code a tool to be indexed to the tool change position;

first memory means for storing a binary coded number of a tool held in the spindle;

second memory means for storing a relationship between binary coded numbers of the tool holding devices and the tool held in the respective tool holding devices;

third memory means responsive to said command means for storing a binary coded number of the commanded tool;

fourth memory means responsive to said index signal generating means for storing a binary coded number of a tool holding device indexed at the tool change position;

means responsive to said command means for searching for a number of a tool holding device holding the commanded tool from said second memory means;

fifth memory means responsive to said searching means for storing the searched number of the tool holding device;

means for determining a rotational direction of said magazine in accordance with a difference in the contents stored in said fourth and fifth memory to thereby cause said rotating means to rotate said magazine and for checking coincidence of the contents in said fourth and fifth memory means;

abnormality check means for checking, in accordance with

said check signal generating means and said fourth memory means, whether a tool holding device holding the commanded tool is correctly indexed to the tool change position after the coincidence of the contents in said fourth and fifth memory means has been found and for causing said rotating means to stop rotation of said magazine to thereby cause a tool exchange operation to be performed when the abnormality is not found; and

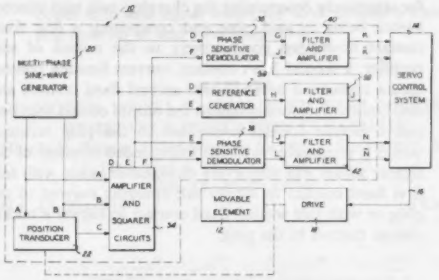
means for loading the content of said third memory means into said first memory means and for loading the content of said first memory means into said second memory means after the tool exchange operation has been completed.

4,109,189

PHASE-SENSITIVE TRANSDUCER APPARATUS WITH IMPROVED SIGNAL OFFSET MEANS

James O. Jacques, Tracy, and Robert Dale Carlson, Danville, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1976, Ser. No. 737,972
Int. Cl.² G05B *1/02*
U.S. Cl. 318—608 **19 Claims**



1. A phase-sensitive transducer apparatus comprising:

first and second relatively movable members, said first relatively movable member having a plurality of windings and said second relatively movable member having a winding;

means for applying a first input signal to one of the windings of said first relatively movable member and a second input signal to another of the windings of said first relatively movable member, an output signal being developed on the winding of said second relatively movable member, said first and second input signals being sinusoidal in nature of substantially identical frequency and peak amplitude and being phase-displaced by a predetermined amount, and said output signal being substantially constant in peak amplitude and variable in phase during relative movement of said first and second relatively movable members;

means responsive to said first input signal and to said output signal for generating a position signal indicative of the relative movement of said first and second relatively movable members, said position signal alternating during such relative movement between first and second voltage levels;

means responsive to said first input signal and to said second input signal for generating a d-c reference signal having a voltage level substantially equal to the voltage level of said position signal when said first input signal and said output signal are phase-displaced by said predetermined amount; and

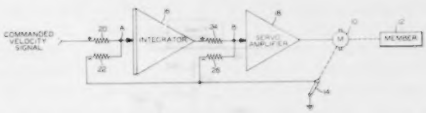
comparator means responsive to said position signal and to said d-c reference signal for offsetting said position signal by an amount represented by the voltage level of said d-c reference signal.

4,109,190

CIRCUIT FOR INCREASING THE OPERATING SPEED RANGE OF A VELOCITY SERVO SYSTEM

Lawrence S. McNaughton, Waynesboro, Va., assignor to General Electric Company, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,930
Int. Cl.² G05B *11/36*
U.S. Cl. 318—609 **3 Claims**



1. A velocity servo system for driving a motor to control the movement of a member comprising:

a. means coupled to the motor for generating a signal indicative of the actual velocity of the member being driven by the motor;

b. integrator means, responsive to a commanded velocity signal indicative of the desired velocity of movement of the member and to the actual velocity signal, for generating a position error signal; and

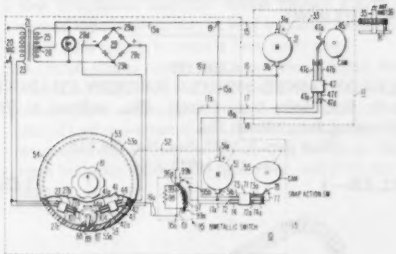
c. means responsive to the difference between the position error signal and the actual velocity signal for generating a signal to drive the motor.

4,109,191

ROTATOR WITH REMOTE INDICATOR AND SELF-SYNCHRONIZATION

John David Callaghan, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,224
Int. Cl.² G05B *11/14*
U.S. Cl. 318—673 **6 Claims**



1. In an antenna rotator of the type including a first remote drive motor for rotating a remote shaft and a control unit including a second motor for driving an indicator-control member into alignment with a preselect member whereupon said motors are de-energized, the improvement for self-synchronization and de-energization of the two motors when the shaft has been rotated to an end stop position comprising:

coupling means for applying energizing potentials to said first motor,

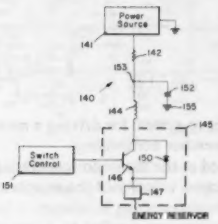
means coupled to said coupling means and responsive to increased current levels along said coupling means caused when said first motor is prevented from rotation by the end stop for applying said energizing potentials directly to said second motor causing direct energization thereof and alignment of the indicator-control member with the preselect member whereby both motors are synchronized and de-energized.

4,109,192

LOW POWER REACTIVE DRIVE CIRCUIT FOR CAPACITIVE LOADS

Ronald Brent Burbank, Olathe, Kans.; Bruce S. Eisenhart, Agoura, Calif.; James R. Hall, Cypress, Calif., and James M. Hamilton, Hawthorne, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 25, 1976, Ser. No. 699,924
Int. Cl.[2] H03K *3/53*
U.S. Cl. 320—1 **5 Claims**



1. A reactive drive circuit for driving a capacitive load comprising in combination:

(a) inductive means;

(b) an energy reservoir;

(c) switching network means, said switching network comprising first and second oppositely poled unidirectional conducting branches at least one branch of which includes a controllable switch;

(d) switch control means coupled to said switching network means for controlling the opening and closing of said controllable switch; and

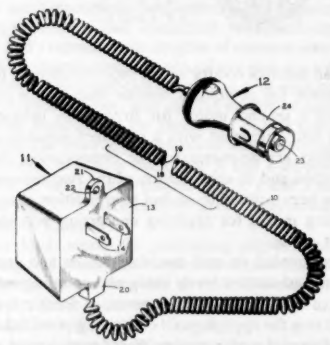
(e) wherein said inductive means, said energy reservoir and said switching network means are coupled in series with one another and are coupled to said capacitive load such that said capacitive load is discharged through said inductive means and said first conducting branch into said energy reservoir; and said capacitive load is charged primarily by energy reapplied thereto from said energy reservoir through said second conducting branch and said inductive means.

4,109,193

SELF-CONTAINED VEHICLE BATTERY CHARGER

James R. Schultheis, Dade County, Fla., assignor to Timco Engineering, Inc., Miami, Fla.

Filed Jan. 3, 1977, Ser. No. 756,133
Int. Cl.[2] H02J *7/00*
U.S. Cl. 320—2 **12 Claims**



1. Apparatus for charging from an A.C. power socket the battery on an automotive vehicle having a cigarette lighter socket with a pair of electrical terminals connected respectively to the ungrounded and grounded terminals of the vehicle battery, said apparatus comprising:

an electrical plug which is manually insertable and removable into and out of the cigarette lighter socket on the vehicle, said plug being complementary to the lighter socket and having electrical terminals which respectively engage the ungrounded and grounded terminals of the lighter socket when the plug is inserted therein;

an insulated power cord having a pair of electrically conductive wires therein connected at one end to the terminals of said plug;

a housing located at the opposite end of the power cord and having a pair of electrically-conductive prongs projecting therefrom for insertion in the A.C. power socket to physically mount said housing directly on the power socket;

a step-down transformer in said housing having its input connected across said prongs and its output operatively connected to the wires of the power cord;

a rectifier having its input operatively connected across the output of said transformer to rectify the step-down voltage output of the transformer, said rectifier having its output operatively connected to the terminals of said plug for supplying the rectified step-down voltage thereto;

and a manually operable selector switch operatively connected between the output of said rectifier and said plug for selectively determining the charging rate, said selector switch being in said plug and comprising a first fixed contact connected conductively to the output of said rectifier, a second fixed contact, current limiting resistor means connected between said second fixed contact and said conductive connection to the output of said rectifier, and a mobile contact connected to the plug terminal which is engageable with the ungrounded terminal of the lighter socket and selectively engageable either with said first fixed contact to supply full charging current to the plug or with said second fixed contact to supply a trickle charge current to the plug.

4,109,194

DIGITAL FEEDBACK CONTROL UTILIZING ACCUMULATED REFERENCE COUNT TO REGULATE VOLTAGE OUTPUT OF SWITCHING REGULATOR

Norman Richards Miller, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 9, 1977, Ser. No. 805,018
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—17 **15 Claims**

5. A digital feedback control for a switching regulator comprising:

means for driving a switching device in said switching regulator including

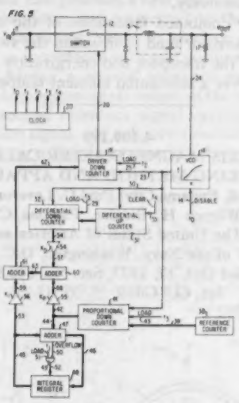
means for generating a signal frequency responsive to a signal magnitude at an output of said switching regulator;

means for generating a first count representative of a derivative of said signal magnitude at an output of said switching regulator;

means for generating a second count representative of an error of said signal magnitude at an output of said switching regulator from a predetermined desired signal magnitude;

means for generating a third count representative of an integral of the error of said signal magnitude at an output of said switching regulator by summing successive second counts to achieve an accumulated count; and

summing said first, second, and third counts to attain a summed count therefrom and decrementing said summed



count with said signal frequency to determine a conduction interval of said switching device.

4,109,195

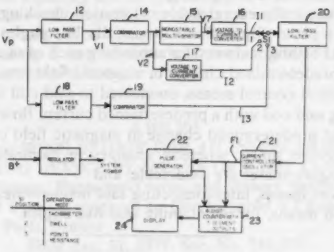
DIGITAL DWELL-TACHOMETER WITH POINTS RESISTANCE INDICATION CAPABILITY

Harold R. Palmer, 10704 Blossom La., Silver Spring, Md. 20903

Filed May 9, 1977, Ser. No. 794,843

Int. Cl.[2] F02P *17/00*

U.S. Cl. 324—15 **6 Claims**



1. A digital dwell tachometer with points resistance indication capability comprising:

means for producing a filtered ignition voltage waveform;

means for producing a first control signal whose average level is proportional to the engine dwell angle;

means for producing a second control signal whose average level is proportional to engine RPM (rotations per minute);

means for producing a third control signal whose value has the binary characteristic of being zero for acceptable ignition points resistance and positive for non acceptable points resistance;

mode select switch means for selecting the operating mode dwell, tachometer or points resistance indication;

means for producing a fourth control signal whose average frequency is proportional to the average level of either the first, second or third control signals depending upon the position of the mode select switch;

means for producing a fifth control signal having a pulse width interval inversely proportional to the number of engine cylinders;

cylinder select switch means for selecting the pulse width of the fifth control signal;

means of counting and converting into a digital display format the number of cycles of the fourth control signal which occur during the pulse width interval of the fifth control signal; and

means of digitally displaying the number of cycles of the fourth control signal which occur during the pulse width interval of the fifth control signal.

4,109,196

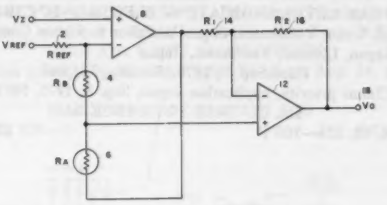
RESISTANCE MEASURING CIRCUIT

Joseph P. Carmody, Willow Grove, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 3, 1976, Ser. No. 747,422

Int. Cl.[2] G01R *27/02*

U.S. Cl. 324—62 **10 Claims**



1. A resistance measuring circuit comprising

a constant current source means,

a first resistance means,

a second resistance means connected in series with said first resistance means across said constant current source means,

a first differential amplifier means having a first input, a second input and an output, said amplifier having a second input gain which is twice a first input gain,

first circuit means connecting a combined signal developed across both of said resistance means to said first input and

second circuit means connecting a signal developed across one of said resistance means to said second input, whereby an output signal from said amplifier means is the difference between the signals applied to said first and second inputs.

4,109,197

PRF DETECTION SYSTEM AND METHOD

Milton R. Lang, Jr., Catonsville, and William A. O'Berry, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 15, 1973, Ser. No. 341,646

Int. Cl.[2] G01R *23/02*

U.S. Cl. 324—78 F **11 Claims**

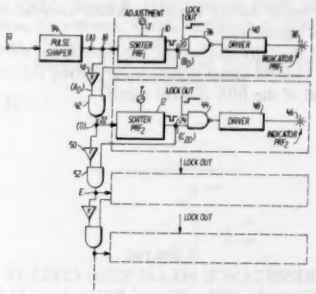
10. A method comprising the steps of:

a. receiving an input signal;

b. examining the received signal for a signal having a first selected PRF;

c. blanking from the received signal, in response to the detection, in the examined signal of a signal having the

first selected PRF, the detected signal to provide a first signal; and



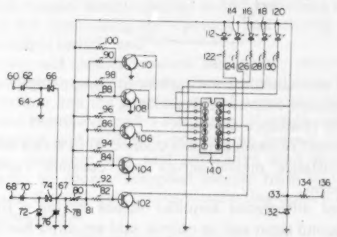
d. examining the first signal for a signal having a second selected PRF.

4,109,198

PEAK LEVEL INDICATING ELECTRONIC CIRCUIT

Shoji Ueno, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Sep. 7, 1976, Ser. No. 721,046
Claims priority, application Japan, Sep. 8, 1975, 50/122791
Int. Cl.[2] G01R *19/16;* H03K *5/20*
U.S. Cl. 324—103 P **13 Claims**



12. A circuit for indicating the peak value of an AC input signal comprising:

a single, monopolar, high voltage DC power supply terminal to which the circuit is connected,

rectifier means including at least one semi-conductor diode, said rectifier means being responsive to the AC input signal for deriving a DC signal having a polarity opposite to that at the terminal and a magnitude directly related to the amplitude of the AC signal,

a transistor having a base, an emitter and collector, one of which is connected to ground, the impedance state between the emitter and collector being either only high or low depending upon the magnitude of a bias voltage at the base,

means for connecting the high voltage terminal and the DC signal to the base so that the transistor is biased into the first impedance state for a zero DC signal amplitude and is biased into the second impedance state for a DC signal amplitude above a predetermined value, said rectifier means including circuit elements causing the DC signal voltage applied to the base of the transistor to have a tendency to increase away from zero as temperature increases, said means for connecting biasing the transistor in the low impedance state while the DC signal has a zero amplitude, increases in ambient temperature having a tendency to cause the transitor to be switched from the low impedance state to the high impedance state at a lower DC current for the base, and

on-off indicator means connected to be responsive to the impedance state between the emitter and collector so that the indicator means is in first and second of its states in response to the impedance being in the first and second states, respectively,

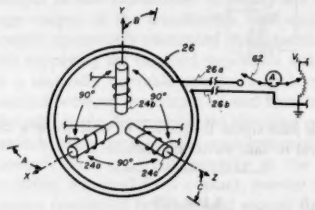
whereby the combined tendencies of the circuit elements and the transistor tend to maintain the switching characteristics of the transistor and energization of the indicator constant over a substantial ambient temperature range.

4,109,199

THREE AXIS MAGNETOMETER CALIBRATION CHECKING METHOD AND APPARATUS

Raymond L. Ball, Panama City; Paul G. Leverone, Panama City Beach, and Warren H. Biegler, Panama City, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1977, Ser. No. 842,840
Int. Cl.[2] G01R *35/00, 33/02*
U.S. Cl. 324—202 **7 Claims**



1. Magnetic field sensing apparatus including a magnetometer having a first, second, and third mutually orthogonal sensors responsive to magnetic field components along first, second, and third mutually orthogonal axes, respectively, and instrumentation means for individually measuring the responses of said sensors, said apparatus being characterized by the improvement comprising:

an electrically energizeable calibration checking coil, lying in a plane disposed at substantially like angles to each of said orthogonal axes, for subjecting each of said sensors to a predetermined change in magnetic field condition;

electrical control means, connected to said coil for energizing said coil with a predetermined current flow to provide said predetermined change in magnetic field condition at selected times, whereby changes in calibration of said magnetometer are detectable; and

support means, interconnecting said magnetometer and said coil means, for maintaining said like angles.

4,109,200

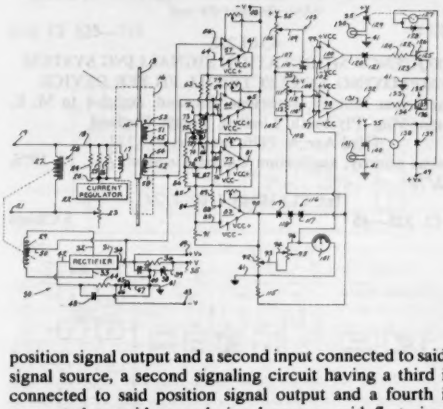
POSITION SENSING DIFFERENTIAL TRANSFORMER SYSTEM WITH MEANS TO CONVERT THE OUTPUT TO AN ABSOLUTE VALUE

Dennis A. McNulty, Tipp City, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jun. 24, 1976, Ser. No. 699,467
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—208 **11 Claims**

1. A measuring apparatus, comprising a position sensing member, a variable differential transformer having a movable coupling element operatively connected to said position sensing member and an output connected to a varying energy source and an output providing an alternating output signal varying in amplitude and phase in response to the selective movement of said coupling element according to the selective movement of said sensing member, translating means for converting an A.C. signal to a D.C. signal and having an input operatively connected to said transformer output and having a position signal output providing a first predetermined magnitude D.C. absolute value position signal in response to a first predetermined position of said coupling element and a second

predetermined magnitude D.C. absolute value position signal different than said first magnitude D.C. absolute value position signal in response to a second predetermined element position spaced from said first position, a first signal source having first reference signal means and connected to the position signal output of the translating means to produce a first reference signal varying in accordance with said position signal, a second signal source having a second reference signal means and connected to the position signal output of the translating means to produce a second reference signal varying in accordance with said position signal, and a detector including a first signaling circuit having a first input operatively connected to said



position signal output and a second input connected to said first signal source, a second signaling circuit having a third input connected to said position signal output and a fourth input connected to said second signal source, said first signaling circuit responding to a first predetermined differential magnitude at said first and second inputs in response to said first magnitude D.C. absolute value position signal and providing a first signaling output indicative of said first element position, said second signaling circuit responding to a second predetermined differential magnitude at said third and fourth inputs in response to said second magnitude D.C. absolute value signal and providing a second signaling output indicative of said second element position.

4,109,201

MEASURING BRIDGE FOR AN INSPECTION OR CHECKING DEVICE BY MEANS OF EDDY CURRENTS

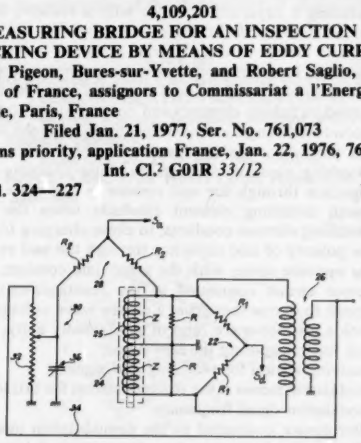
Michel Pigeon, Bures-sur-Yvette, and Robert Saglio, Massy, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 21, 1977, Ser. No. 761,073

Claims priority, application France, Jan. 22, 1976, 76 01727

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—227 **1 Claim**



1. Measuring double bridge for a device for inspecting and also checking by eddy currents, said double bridge comprising both an absolute measuring bridge and a differential measuring bridge, said differential measuring bridge comprising a first pair of branches constituted by two resistors R1 and a second pair of branches constituted by two windings, two supplementary resistors R being connected in parallel to the two windings with the midpoints of said resistors R and said windings being grounded, said first pair of branches and said second pair of branches being connected in parallel to a supply transformer, a first output for a differential measuring signal connected between said two resistors R1 of said first pair of branches; said absolute measuring bridge comprising a first pair of branches constituted by two resistors R2 and a second pair of branches constituted by one of said windings of said second pair of branches of said differential measuring bridge connected at its ungrounded end to one end of one of the resistors R_z and by a voltage compensating circuit comprising a variable capacitor grounded at one end and connected at the other end to one end of the other resistor R_z and to the tap of a potentiometer connected to said transformer and a second output for an absolute measuring signal connected between the other ends of said two resistors R2 of said first pair of branches.

4,109,202

TRAFFIC SWITCHING IN COMMUNICATIONS SATELLITES

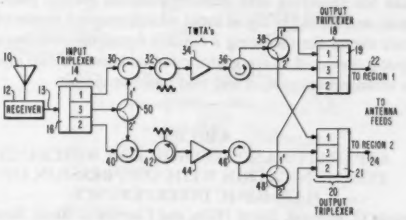
Chandra Mohan Kudsia, Dollard-des-Ormeaux; Harry John Moody, Pierrefonds, and Lorne Allan Keyes, Montreal, all of Canada, assignors to RCA Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,656

Claims priority, application United Kingdom, Aug. 24, 1976, 35194/76

Int. Cl.[2] H04B *7/20;* **H03H** *7/46*

U.S. Cl. 325—3 **8 Claims**



6. In combination,

a first signal path including a first input band-pass filter for signals in a first frequency band, an input circulator, an amplifier, an output circulator and a first output band-pass filter for signals in said first frequency band,

a second signal path including a second input band-pass filter for signals in a second frequency band, an input circulator, an ampifier, an output circulator and a second output band-pass filter for signals in said second frequency band,

a third input band-pass filter for signals in a third frequency band selectably connectable to the input circulator in said first or second paths, and

two additional output band-pass filters for signals in said third frequency band, each coupled to an output circulator in a respective one of said first and second signal paths.

4,109,203

DELTA-MODULATION ENCODER

Ludwig Desire' Johan Eggermont; Eise Carel Dijkmans, and Karel Riemens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,078

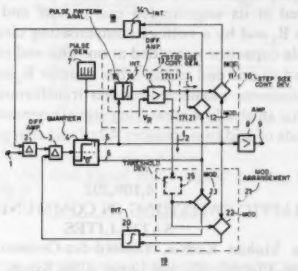
Claims priority, application Netherlands, Jun. 12, 1975, 7506986

Int. Cl.[2] H03K *13/22*

U.S. Cl. 325—38 B **4 Claims**

1. A delta-modulation encoding arrangement for informa-

tion signals comprising an input circuit which comprises a cascade circuit of a decoding arrangement and a comparison circuit coupled to said decoding arrangement, input means for receiving said information signals and for providing it to said cascade circuit, and output means for providing an output signal; a quantizing device means having an input coupled to said input circuit output means, and an output means for producing delta-modulation output pulses; a pulse generator coupled to said quantizing device; a feedback circuit coupled between said quantizing device output means and said cascade



circuit and including dynamic compression step-size control device means for varying the energy contents of the delta modulation output pulses applied to said cascade circuit; and compensation means comprising a modulation arrangement having an input coupled to said quantizing device output means for receiving said delta-modulation output pulses, an output, and a control signal input means coupled to one of said device means for receiving a control signal derived from said output pulses, and an integrator coupled between said modulation arrangement output and said cascade circuit.

4,109,204

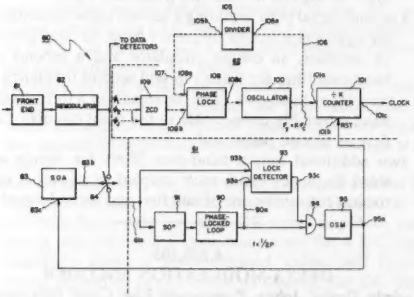
APPARATUS AND METHOD FOR WIDEBAND COMMUNICATION WITH SUPPRESSION OF HARMONIC INTERFERENCE

Thomas G. Kincaid, Burnt Hills, and Charles A. Stutt, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,614

Int. Cl.[2] H04L *25/08*

U.S. Cl. 325—38 R **21 Claims**



1. A method for transmitting information with a desired bandwidth while suppressing interference thereto from harmonics of a system-wide signal, comprising the steps of:

(a) providing a data carrier having a frequency essentially midway between an adjacent pair of harmonics of the system-wide signal;

(b) transforming each of a plurality of bits of the information into a signal comprising a pair of like-polarity pulses, each pulse having a time duration T;

(c) setting a time interval P between the pair of pulses to be essentially equal to twice the reciprocal of the frequency difference between the frequency of the data carrier and the frequency of the adjacent harmonics of the system-wide signal;

(d) modulating one of the parameters of the data carrier with the pulse-pair signal to be transmitted;

(e) transmitting the modulated data carrier to a receiving end; and

(f) detecting the pulse-pair signal to recover at the receiving end each bit of data therein.

4,109,205

FREQUENCY MODULATION SIGNALLING SYSTEM EMPLOYING AN ELECTRICAL FILTER DEVICE

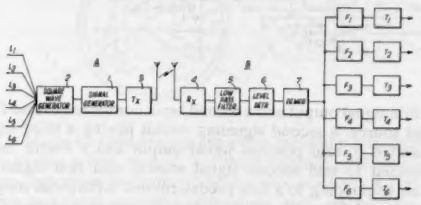
Ernest James Moorey, Ivybridge, England, assignor to M. L. Engineering (Plymouth) Limited, Slough, England

Filed Apr. 6, 1976, Ser. No. 674,722

Claims priority, application United Kingdom, Apr. 12, 1975, 15123/75

Int. Cl.[2] H04B *1/00, 7/24*

U.S. Cl. 325—45 **5 Claims**



1. An electrical signalling system comprising:

a transmitter station having a signal generator arranged to generate an electrical oscillatory signal of a predetermined fundamental frequency;

modulation means at the transmitter station for frequency-modulating the said signal with a preselected modulation signal frequency including a resistance-capacitance circuit including a capacitor in series with a resistor, first and second transistor switching elements operative to connect the said circuit to two different stabilized voltages, and third and fourth transistor switching elements connected to opposite sides of the said capacitor from the first and second switching elements and connected to the first and second switching elements respectively whereby in operation the third switching element conducts when the first switching element conducts to cause charging of said capacitor through the said resistor in one sense and the fourth switching element conducts when the second switching element conducts, to cause charging to reverse the polarity of said capacitor through the said resistor in the opposite sense, with the same time constant, and an output circuit connected to the resistance-capacitance circuit to derive therefrom a square wave voltage output with a mark-to-space ratio of substantially unity;

means for transmitting the said signal;

a receiving station for receiving said signal;

demodulation means at the receiver station for extracting the modulation signal frequency;

a filter device connected to the demodulation means, said filter device being tuned to the said modulation signal frequency and providing a corresponding output signal only when said modulation signal is present in sufficient amplitude; and

timer means adapted to provide an output only when the said output signal of the filter device is present for a predetermined time interval, the said filter device comprising a

transistor amplifier stage having a frequency selective positive feedback circuit responsive to said modulation signal frequency, and such that failure of any component of the feedback circuit results in a reduction in the overall gain of the amplifier stage.

4,109,206

SIGNAL STRENGTH METER DRIVE CIRCUIT

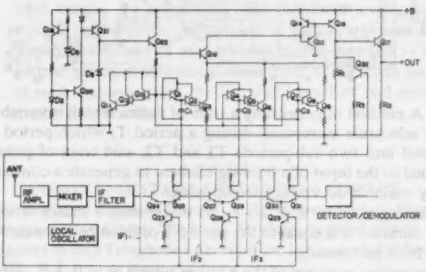
Tatsuo Numata, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,611

Claims priority, application Japan, Jun. 17, 1976, 51-70353

Int. Cl.[2] H04B *1/16*

U.S. Cl. 325—319 **8 Claims**



1. In a signal strength meter drive circuit for a radio receiver or tuner including a plurality of intermediate frequency amplifiers, means for rectifying the outputs of said amplifiers, amplifier means for summing said rectified outputs, said amplifier means including a load resistor, an output circuit for shifting the level of the voltage across said load resistor for driving said meter, and circuit means for supplying biasing voltages to the above circuit components, the improvement characterized by:

shunt circuit means connected in parallel with said load resistor and including variable conduction means controlled by said biasing circuit means, whereby said shunt circuit means draws off a proportion of said load resistor current to thereby compensate for variations in the voltage characteristics of the various circuit components.

4,109,207

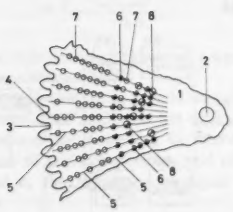
CODING MEMBER FOR PROGRAMMING OF A RADIO COMMUNICATION APPARATUS

Ole Simon Petersen, Aalborg, Denmark, assignor to S. P. Radio A/S, Aalborg, Denmark

Filed Oct. 27, 1976, Ser. No. 736,246

Int. Cl.[2] G08C *9/08*; H01H *19/63*; H04B *1/06*

U.S. Cl. 325—455 **6 Claims**



1. A coding member for programming of a radio communication apparatus, in which the frequency selected is synthesized using a programmable frequency divider with a dividing figure N, and in which the coding member may be secured in a number of positions using an indexing mechanism, each position corresponding to a communication channel, the above coding member being provided with a number of rows of spaces placed in a direction which is mainly perpendicular to that in which the coding member is moved when adjusted to a particular channel, and that the intersection points on the coding member between a radial corresponding to a communication channel and a row of spaces will be a code combination selected from different mechanical code representations from a group of code representations which include empty spaces, empty spaces each with a threaded hole and projections, and some of the projections are permanent and some of the projections are semi-permanent so that expressions of mechanical coding will include binary codes in both permanent and semi-permanent mechanical representation along each radial and whereby the presence of a projection in any row in a radial can be used to close a corresponding contact in a set of contacts corresponding to the number of rows of spaces.

4,109,208

WAVEFORM PRODUCING SYSTEM

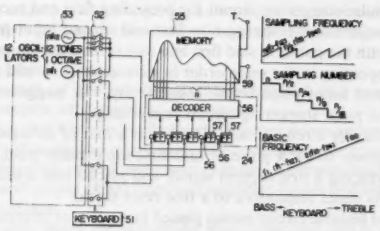
Norio Tomisawa; Takehisa Amano, both of Hamamatsu; Yasuji Uchiyama, Hamakita, and Takatoshi Okumura, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 276,103, Jul. 28, 1972, abandoned. This application Mar. 10, 1975, Ser. No. 556,951

Claims priority, application Japan, Jul. 31, 1971, 46-57830; Sep. 16, 1971, 46-71245; Sep. 31, 1971, 46-57831; Sep. 22, 1971, 46-73441

Int. Cl.[2] H03B *19/00*

U.S. Cl. 328—13 **9 Claims**



1. A waveform producing system comprising:

a plurality of switches, each of said switches corresponding to a respective basic output frequency,

a clock signal generator means having a plurality of outputs connected to said switches for generating a plurality of clock pulse trains, each of said clock pulse trains having a frequency which is a multiple of at least one of said basic output frequencies,

means for memorizing the wave shape of a predetermined waveform, said memory means including a plurality of memory elements each of which stores a predetermined value of said waveform corresponding to the amplitude of the predetermined waveform at respective sampling intervals of said waveform,

decoder means connected to said memory means for coupling addressing signals thereto, said decoder means including a plurality of outputs, one each connected to a respective memory element,

means interconnecting said switches and said decoder means and responsive to said clock pulse trains for energising said decoder means in accordance with the switch closed and the frequency of the clock pulse train coupled thereto, wherein addressing signals are provided at the outputs of said decoder at the frequency of said connected clock pulse train, and wherein the total number of the addressing signals provided at the output terminals of said decoder decreases as the selected basic output frequency selected by the corresponding closed switch increases as different selected switches are closed to thereby maintain

the frequency at which said memory elements are addressed within a predetermined small range, and

means responsive to said addressed memory elements for reading out the waveform stored in said memory means, said read-out waveform having a basic output frequency corresponding to the closed switch.

4,109,209

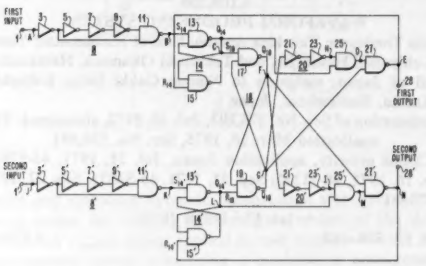
PULSE STAGGERING CIRCUIT

Otto Herbert Bismarck, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,152

Int. Cl.[2] H03K *3/64*

U.S. Cl. 328—60 **8 Claims**



1. A pulse-staggering circuit for providing first and second output pulse trains responsive to first and second input pulse trains, with the pulses in said first and said second output pulse trains appearing in the same order in time as those in said first and second input pulse trains, respectively, but staggered in time, said pulse staggering circuit comprising:

first bistable circuit means placed into a first of its states in response to each pulse of said first input pulse train, for producing a first control signal, and placed into a second of its states responsive to a first reset signal;

second bistable circuit means placed into a first of its states in response to each pulse of said second input pulse train, for producing a second control signal, and placed into a second of its states responsive to a second reset signal;

third bistable circuit means having a set input receptive of a set signal corresponding to said first control signal, and having a reset input receptive of a third reset signal corresponding to said second control signal, said third bistable circuit means of a type responsive to either the occurrence of said set signal in the absence of said third reset signal, for producing a first blocking signal and extinguishing a second blocking signal, or to the occurrence of said third reset signal in the absence of said set signal for both producing said second blocking signal and extinguishing said first blocking signal;

first gating means receiving as input signals said first control and second blocking signals, responsive to the concurrence of said first control signal and the absence of said second blocking signal, for producing a first output signal, applied as the first reset signal to said first bistable circuit means, to extinguish said first control signal, and consequently to extinguish said first output signal; and

second gating means receiving as input signals said second control and first blocking signals, responsive to the concurrence of said second control signal and the absence of said first blocking signal, for producing a second output signal, applied as the second reset signal of said second bistable circuit means to extinguish said second control signal, and consequently to extinguish said second output signal.

4,109,210

METHOD OF GENERATING A VARIABLE TRAIN OF PULSES

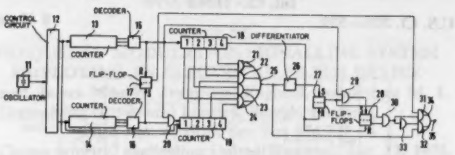
Albrecht Gerlach, Freiamt; Dieter Holzmann, Freiburg, both of Germany; Daniel Mlynek, Wolfgantzen, France, and Dirk Hoffmeister, Mahlberg, Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Feb. 9, 1977, Ser. No. 766,991

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608268

Int. Cl.[2] H03K *3/64*

U.S. Cl. 328—61 **4 Claims**



1. A method of generating a train of pulses which is variable in N selectable increments during a period T, which period is divided into two sub-periods T1 and T2, said train of pulses applied to the input of a filtering element to generate a continuously variable dc voltage, comprising:

allotting n ($n = 0, 1, 2 \ldots N$) increments n pulses whose duration B is equal to the period T divided by the number N of increments;

generating m pulses of the n pulses where $m = 0, 1, 2 \ldots M$; ($M < N$) in one sub-period T1 of the period T and the remainder of the n pulses in the other sub-period T2 of the period T such that for $n \leqq M$, m pulses are lined up in the sub-period T1 with no space therebetween and for $M < n \leqq N$, k bursts ($k = 1, 2 \ldots K$; $K = (N-M)/M$) of M unspaced pulses of the duration B are formed from the n pulses, which bursts are distributed substantially evenly over the sub-period T2 and, for $k > K/2$, follow each other at least partly with no space therebetween, those pulses not forming a full burst are generated as m unspaced pulses in the sub-period T1.

4,109,211

VARIABLE THRESHOLDING CIRCUIT FOR CONVERTING AN ANALOG SIGNAL TO A BINARY SIGNAL

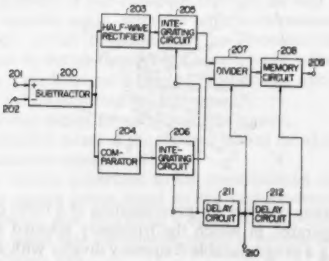
Michihiro Mese, Hachioji; Masakazu Ejiri, Tokorozawa; Seiji Kashioka, Kokubunji; Takafumi Miyatake, Hachioji, and Toshimitsu Hamada, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 16, 1976, Ser. No. 649,809

Claims priority, application Japan, Jan. 16, 1975, 50-6266; Nov. 14, 1975, 50-136379

Int. Cl.[2] H03K *5/18*

U.S. Cl. 328—116 **12 Claims**



1. A variable thresholding circuit comprising:

first means, to which an analog signal is applied;

second means coupled with said first means, for converting said analog signal into binary signals with a variable threshold level; and

third means coupled with said first and second means, for controlling said threshold level of said second means, said third means comprising

fourth means for storing a predetermined threshold level;

fifth means coupled with said first and fourth means, for calculating a value related to a required threshold level from average levels of the upper and lower portions of said analog signal which have levels higher and lower than said predetermined threshold level, respectively;

sixth means coupled with said fifth means, by which the output of said fifth means is compared with a predetermined value; and

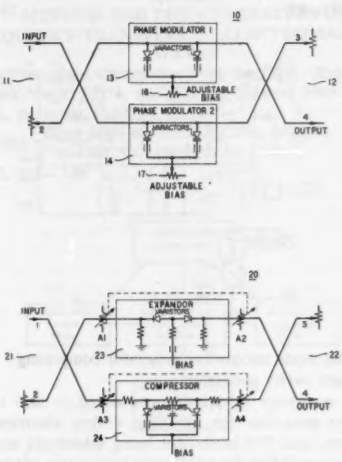
seventh means coupled with said second, fourth, fifth and sixth means, for calculating said threshold level of said second means from the outputs of said fourth and fifth means, the output of said seventh means supplied to said second means in response to the output of said sixth means in such a manner that the threshold level of said second means is controlled.

4,109,212

COMPLEMENTARY DISTORTION CIRCUIT

John Robinson Donnell, Exeter, N.H.; George Ludwig Heiter, Andover, and Hotze Miedema, Boxford, both of Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1976, Ser. No. 736,995
Int. Cl.[2] H03B *1/04*
U.S. Cl. 328—163 **10 Claims**



1. A distortion compensating circuit for a signal path subject to distortion characterized by:

means for dividing the signal in said signal path into two components of equal amplitude but differing phase;

a first, non-linear phase modulator for introducing a phase-shift into one of said components, said phase-shift being proportional to the instantaneous signal power in said component;

a second, non-linear phase modulator for introducing a phase-shift into the other one of said components, said phase-shift being proportional to the instantaneous signal power in said component; and

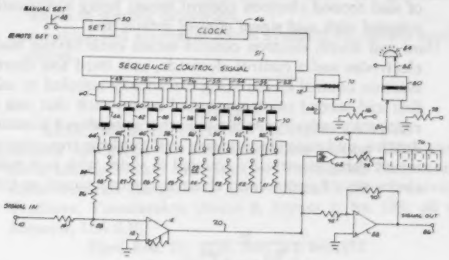
means, connected to the output of said first and second phase modulators, for re-combining said phase-shifted components.

4,109,213

DIGITAL AUTOMATIC GAIN AMPLIFIER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Larry D. Holley, Merritt Island, and James O. Ward, Titusville, both of Fla.

Filed Mar. 24, 1977, Ser. No. 780,729
Int. Cl.[2] H03F *1/00, 1/36*
U.S. Cl. 330—2 **6 Claims**



1. An apparatus for adjusting the amplitude of a reference signal to a predetermined level so as to permit subsequent data signals to be interpreted correctly, said apparatus comprising:

(a) an operational amplifier;

(b) a feedback circuit connected between an output terminal and an input terminal of said operational amplifier;

(c) a plurality of resistors;

(d) a reference voltage source;

(e) a comparator comparing an output voltage of said amplifier with said reference voltage and generating a compared signal;

(f) a bank of relays;

(g) each of said relays operably connected to a respective resistor of a plurality of resistors;

(h) means for selectively energizing said relays according to said compared signal from said comparator for connecting selected ones of said resistors in said feedback circuit until said output signal from said amplifier equals said reference voltage;

(i) said means for selectively energizing said relays including:

(i) a sequence control circuit having a plurality of output terminals,

(ii) means for enabling said sequence control circuit sequencially generating a signal on said plurality of output terminals,

(iii) a plurality of logic control circuits each of which is connected between a respective output terminal of said sequence control circuit and a respective relay for energizing a respective relay responsive to receiving a signal from said sequence control circuit, and

(iv) means for applying said compared signal to said logic control circuits for deenergizing said relays when said output voltage of said amplifier exceeds said reference voltage.

4,109,214

UNBALANCED-TO-BALANCED SIGNAL CONVERTER CIRCUIT

W. Eric Main, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 31, 1977, Ser. No. 802,170
Int. Cl.[2] H03F *3/45, 3/04;* **H03G** *3/00*
U.S. Cl. 330—254 **19 Claims**

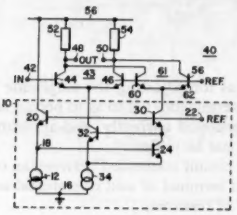
15. An unbalanced-to-balanced signal converter circuit for providing a pair of balanced output signals with magnitudes the sum of which is virtually equal to the magnitude of a control signal, including in combination:

driver circuit means for providing the unbalanced signal;

signal control means for providing the control signal;

first and second electron control means each having main electrodes and a control electrode, said control electrodes of said first and second electron control means being electrically coupled to said driver circuit means such that one is rendered conductive while the other is rendered non-conductive, said first electron control means conducting a signal having a magnitude substantially equal to the magnitude of the unbalanced signal, said main electrodes of said second electron control means being electrically coupled with said signal control means; and

third and fourth electron control means each having main electrodes and a control electrode, said third and fourth electron control means being electrically coupled to said first and second electron control means such that one is rendered conductive while the other is rendered nonconductive, said main electrodes of said third electron control means being electrically coupled in series with said main electrodes of said second electron control means so that



the signals through said second and third electron control means constantly have virtually equal magnitudes, said main electrodes of said fourth electron control means being electrically coupled to said signal control means in parallel with said main electrodes of said second electron control means so that the magnitude of the signals through said second and fourth electron control means virtually equals the magnitude of said control signal, said control electrode of said fourth electron control means being electrically coupled to said first and second electron control means such that said fourth electron control means conducts a current having a magnitude virtually equal to the magnitude of the unbalanced input signal so that said third electron control means provides one of the balanced output signals and one of said first and fourth electron control means provides the other of the balanced output signals, the sum of the magnitudes of the balanced output signals thereby being virtually equal to the magnitude of the control signal.

4,109,215

DUAL MODE OUTPUT AMPLIFIER FOR A SAMPLE AND HOLD CIRCUIT

Donald Thomas Comer, Los Gatos; Daniel Joseph Dooley, Saratoga; George Erdi, Palo Alto, and Paul Raymond Henneuse, San Jose, all of Calif., assignors to Precision Monolithics, Inc., Santa Clara, Calif.

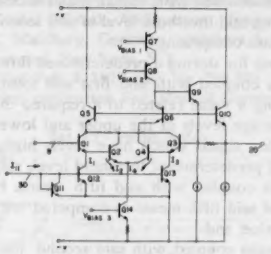
Filed Apr. 27, 1977, Ser. No. 791,272
Int. Cl.[2] H03F *3/45*
U.S. Cl. 330—254 **10 Claims**

1. An output amplifier for a sample and hold circuit having at least two distinct operative modes including a sample mode and a hold mode and thereby defining different slew rates and input bias currents comprising:

means for receiving a first input signal that may have a random waveshape;

means for receiving a second input signal having at least two distinct levels, one high and defining thereby a sample mode and one low, defining thereby a hold mode;

means for mirroring said second input signal current to selected emitter node elements of the amplifier capable of influencing the slew rate thereof;



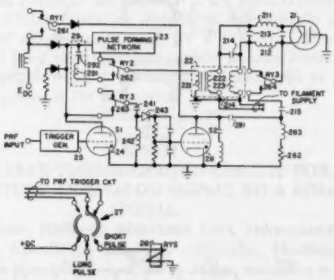
means for changing the response characteristics of said amplifier in response to said mirrored second input signal current so as to conform the amplifier to one of said at least two distinct operative modes.

4,109,216

MICROWAVE GENERATOR

Reuben E. Nyswander, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 31, 1977, Ser. No. 802,349
Int. Cl.[2] H03B *9/10;* **H03K** *3/55*
U.S. Cl. 331—87 **10 Claims**



1. A dual mode microwave generator comprising:

a resonant cavity generator;

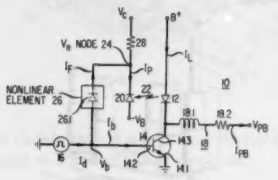
a first modulator electrically connected to said resonant cavity generator for applying a first electrical pulse thereto, said first modulator being selectively actuatable to apply said first electrical pulse having one of two different heights, the first pulse height being sufficient to cause said resonant cavity generator to output a pulse of microwave energy of substantially the same duration as said first pulse, and said second pulse height being sufficient to hold said resonant cavity generator in the Hartree voltage region where microwave oscillation therein is incipient; and

a second modulator electrically connected to said resonant cavity generator and actuated to supply a second electrical pulse thereto during the application of said first electrical pulse having said second pulse height, the second pulse being of a shorter duration than said first electrical pulse and of an amplitude to cause said resonant cavity generator to produce a microwave energy output for substantially the same duration as said second pulse.

4,109,217
STABILIZATION CIRCUIT FOR JUNCTION LASERS

Charles Arthur Brackett, Summit, and Richard Grant Smith, Basking Ridge, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 10, 1976, Ser. No. 749,357
Int. Cl.[2] H01S *3/10*
U.S. Cl. 331—94.5 S **4 Claims**



1. A stabilization circuit comprising a drive transistor connected in common emitter configuration and having emitter, base and collector electrodes; a junction laser coupled between said collector and emitter electrodes; a photodetector coupled to said emitter electrode; a portion of the radiated output from said laser being coupled to said photodetector; and means for coupling an input signal between said base and emitter electrodes; characterized in that:

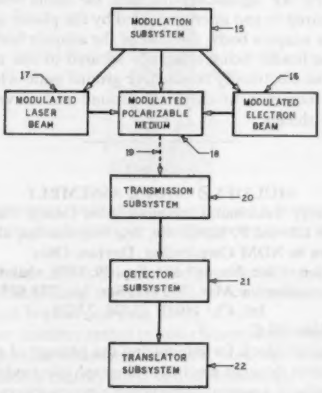
said photodetector is coupled between a voltage node of said circuit and said emitter electrode; and

a nonlinear rectifying junction element is coupled between said node and said base electrode.

4,109,218
METHOD FOR THE GENERATION OF FREQUENCY-TRANSFERRED ELECTROMAGNETIC WAVES

Stanley Schneider, 26628 Fond du Lac Rd., Rancho Palos Verdes, Calif. 90274, and Richard Spitzer, 2946 Claremont Blvd., Berkeley, Calif. 94705

Filed Mar. 28, 1975, Ser. No. 563,178
Int. Cl.[2] H01S *3/30, 3/10*
U.S. Cl. 332—7.51 **1 Claim**



1. A method for generating highly directional frequency-transferred electromagnetic waves of narrow frequency band encompassing a specific controllable frequency, said method comprising,

adjusting the frequency of an incident electromagnetic wave of narrow frequency band, the properties of an incident beam of moving electrically charged particles, and the polarizability characteristics of a polarizable medium capable of supporting electromagnetic shock radiation at the frequency of said generated waves, to values required to produce said generated radiation at said specific transferred frequency,

bringing said incident electromagnetic wave and said incident charged particles together in said medium so as to cause said incident wave to stimulate by acceleration said charged particles to radiate in said medium

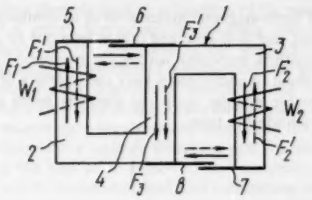
utilizing said medium to reradiate electromagnetic waves at said transferred frequency and to focus said generated waves in specific directions,

and making said generated waves available for further application.

4,109,219
ELECTROMAGNETIC SWITCHING DEVICE

Konkordy Innokentievich Kharazov, ulitsa Valtera Ulbrinkhta 13/3, korpus 15, kv. 110; Gennady Viktorovich Netsvetaev, ulitsa Generala Karbysheva 1, kv. 62, and Valery Ivanovich Trofimov, Yaroslavskoe shosse 8, korpus 1, kv. 159, all of Moscow, U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,152
Int. Cl.[2] H01H *51/24*
U.S. Cl. 335—78 **5 Claims**



1. An electromagnetic switching device comprising: a magnetic circuit having a center and at least two open side legs; two control windings, one of said windings being placed on each of said open side legs; at least two magnetically responsive contacts, each contact having at least two contact members, one of said contact members of at least one of said magnetically responsive contacts being placed on each of said open legs; said magnetic circuit having a shape that when a first control signal is fed to one of said control windings a larger magnetic flux is produced in the side leg with an energized winding, said larger flux switching the closest magnetically responsive contact, and a lesser magnetic flux in the side leg with a de-energized winding, said lesser magnetic flux switching off the closest contact, said magnetic fluxes being reversed when a second control signal of opposite polarity is fed to the other of said control windings.

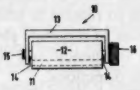
4,109,220
CATHODE RAY TUBE ASSEMBLIES

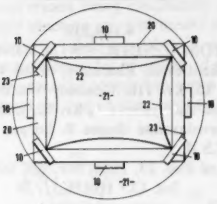
Norman Eli Peart, Grotton, Near Oldham, England, assignor to Limited Ferranti, Hollinwood, England

Filed Oct. 22, 1976, Ser. No. 734,878
Claims priority, application United Kingdom, Oct. 24, 1975, 43836/75
Int. Cl.[2] H01F *7/00*
U.S. Cl. 335—212 **4 Claims**

1. A cathode ray tube assembly including a cathode ray tube having an envelope and a screen, a plurality of permanent magnets each having a pair of pole pieces for at least partially correcting pin cushion and barrel distortion of displays on the screen of the cathode ray tube, a support for each magnet secured to an associated predetermined position in relation to the envelope of the cathode ray tube, at least one magnet being adjustably mounted, to vary the intensity of the field of the magnet upon the electron beam produced within the cathode

ray tube, by comprising at least part of a member rotatably mounted on the associated support, and means to clamp the member in its required rotational position on its associated support, each support for a rotatable member being generally U-shaped with a member rotatably mounted between the arms





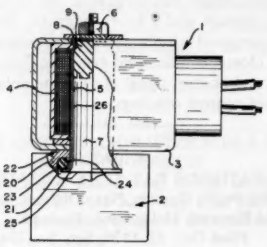
thereof, is of ferro-magnetic material so as to comprise a shunt for the magnet, and is so arranged that at least one air gap of an adjustable width is provided within the magnetic circuit including the shunt to additionally vary the intensity of the field of the adjustable magnet upon the electron beam produced within the cathode ray tube.

4,109,221

RETAINING MEANS FOR A SOLENOID ASSEMBLY

Jude A. Pauli, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 9, 1976, Ser. No. 748,830
Int. Cl.[2] H01F *3/00*
U.S. Cl. 335—251 **7 Claims**



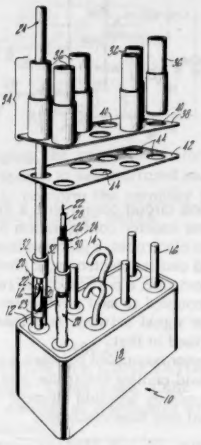
1. In a solenoid valve having a one piece core tube, a top plug in an outer end of said core tube, said core tube having a thin cylindrical side wall, and an integrally formed, continuous, thin top wall, the improvement comprising fastening means mounted to said top wall without penetrating through said top wall, said fastening means having a member extending outwardly from said top wall, said member having means for engaging a fastener formed in it, said fastening means being welded to said core tube and extending outwardly from the closed end thereof, and a fastener intermounted with said fastening means.

4,109,222

RELAY AND RF ADAPTOR ASSEMBLY

Paul A. Frano, Windsor Locks; Robert W. Bowman, Enfield; Donald F. Drapeau, Windsor, and Marino Kain, Bloomfield, all of Conn., assignors to HI-G Incorporated, Windsor Locks, Conn.

Filed Nov. 14, 1975, Ser. No. 631,874
Int. Cl.[2] H01F *7/00*
U.S. Cl. 335—301 **10 Claims**



1. A miniature relay assembly comprising an electrically conductive header with a flat face and terminals supported thereon including a plurality of radio frequency signal-carrying pins projecting from the header, and a radio frequency adaptor comprising a one-piece preformed subassembly of unitary construction having an electrically conductive adaptor body including a planar supporting base with at least as many holes therein as there are radio frequency signal-carrying pins, said holes for the RF signal-carrying pins extending through the adaptor body, the adaptor body defining a plurality of hollow coaxial cable receiving shells surrounding each of said holes for the RF signal-carrying pins, the shells being permanently secured to and interconnected by the planar supporting base of the adaptor body, the base of the adaptor body and the face of the header being integrally secured to one another to complete an electrically conductive ground path, whereby the shells are common to electrical ground and serve as radio frequency shields.

4,109,223

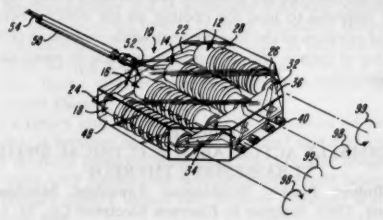
MULTIPLE CHOKE ASSEMBLY

Robert Henry Tenkman, Cincinnati; Alan George Furler, Dayton, and Edward F. McGinnis, Jr., Waynesville, all of Ohio, assignors to NDM Corporation, Dayton, Ohio

Continuation of Ser. No. 617,431, Sep. 29, 1975, abandoned. This application Mar. 3, 1977, Ser. No. 773,855
Int. Cl.[2] H01F *15/04, 27/28*
U.S. Cl. 336—84 C **6 Claims**

1. A patient block for minimizing the passage of electrosurgery currents through electrocardiograph electrodes contacting the body of a patient undergoing electrosurgery, comprising: a plurality of electrically separate and spaced apart chokes, and potting means surrounding said chokes and filling the spaces between said chokes, each said choke having a start portion and a termination portion, each said choke having first means projecting through said potting means for electrical connection of one of its start and termination portions to one of said electrodes, and each said choke having second means projecting through said potting means for electrical connection of the other of its start and termination portions to an

electrocardiograph monitor, adjacent chokes in said patient block having opposite lays so as to minimize arcing between



said adjacent chokes should one of said chokes not be electrically connected to a body contact electrode.

4,109,224

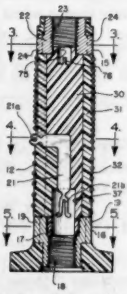
PRECISION INJECTION-MOLDED COIL FORM AND METHOD AND APPARATUS FOR MANUFACTURE

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Continuation of Ser. No. 762,637, Jan. 26, 1977, abandoned, which is a continuation of Ser. No. 676,682, Apr. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 639,421, Dec. 10, 1975, abandoned. This application Aug. 5, 1977, Ser. No. 822,209

Int. Cl.[2] H01F *27/30*

U.S. Cl. 336—192 **14 Claims**



1. An injection-molded coil form having a precision surface for supporting an inductance winding, comprising, in combination:

a generally cylindrical core member including a longitudinally extending channel and a communicating axially aligned bore at one end;

a contact member seated in said channel including a connector portion extending into said bore and a tap portion projecting radially from said core member;

a pair of electrically conductive end fittings secured to respective ends of said core member, one of said end fittings including a central bore communicating with said axially aligned bore in said core and forming in conjunction with said connector portion of said contact member electrical connection means for said winding; and

a thin plastic over-layer molded over said core member for supporting said inductance winding, said tap portion projecting through said layer for connection to said winding.

4,109,225

TEMPERATURE REGULATOR AND SAFETY THERMOSTAT

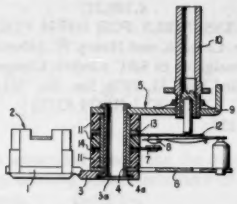
Walter Hollweck, Nuremberg, Fed. Rep. of Germany, assignor to Inter Control Hermann Köhler Elektrik GmbH & Co. KG, Nuremberg, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,749

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1975, 2546274

Int. Cl.[2] H01H *71/16*

U.S. Cl. 337—42 **3 Claims**



1. In an assembly including a temperature regulator sensing the temperature to be regulated and controlling an electric current flow therethrough as a function of the sensed temperature and a safety thermostat interrupting the current flow independently of the operation of the temperature regulator upon sensing a predetermined temperature; the safety thermostat having a heat conducting baseplate; the improvement comprising a heat conducting means for mechanically connecting said temperature regulator and said safety thermostat with one another into a unitary structure and for simultaneously supplying the heat to be sensed to said temperature regulator and said safety thermostat; said heat conducting means including a member constituting an extension of said baseplate and projecting beyond said safety thermostat and a rivet passing through said extension and holding together components of said temperature regulator; first movable contact means connected to and forming part of said temperature regulator and second movable contact means connected to and forming part of said safety thermostat; said first and second movable contact means being structurally separate from said safety thermostat and said temperature regulator, respectively.

4,109,226

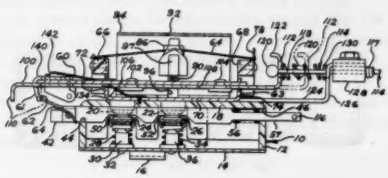
DISCONNECT SWITCH WITH RESET MECHANISM

Teamus Bowling, Fern Creek, and Benjamin M. Thomson, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 1, 1977, Ser. No. 773,195

Int. Cl.[2] H01H *71/18*

U.S. Cl. 337—130 **8 Claims**



1. A ground fault disconnect switch for controlling the flow of current in a circuit and interrupting the flow in the event of a predetermined high current, said switch comprising a housing with fixed and movable electric contact means for making and breaking the circuit, biasing means for holding the movable contact means in engagement with the fixed contact means, biased actuator means for forcing the movable contact means away from the fixed contact means, and latch means for disabling the actuator means, an adjustable thermal-responsive

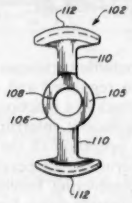
means acting upon the said latch means for holding the latch means in engagement with the said actuator means, whereby a predetermined current flow in the circuit causes the thermal-responsive means to release the latch means from engagement with the actuator means so the actuator means is free to open the switch contacts; the invention comprising a manual latch reset mechanism for cocking the actuator means so the actuator means is disabled, said reset mechanism including a remote controlled biased bar that is carried by the latch means and is movable with respect thereto.

4,109,227

CONTACT ASSEMBLY FOR HIGH VOLTAGE FUSE

Bruce A. Biller, Chicago, and Henry W. Scherer, Mt. Prospect, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Nov. 11, 1976, Ser. No. 741,028
Int. Cl.[2] H01H *85/16*
U.S. Cl. 337—252 **12 Claims**



1. A contact assembly for a high voltage fuse comprising:

a contact bridge having center portion with an opening through the center portion, said contact bridge including arms projecting outwardly from the center portion, said arms having means for engaging the interior of the fuse to retain the contact bridge in a fixed position;

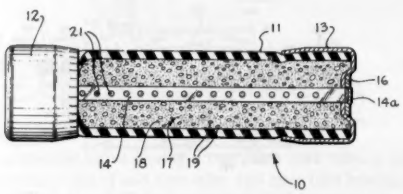
a contact element having a first end dimensioned to fit into said opening in said center portion, said contact element being attached to said bridge by swaging, said contact element having a second end extending from said contact bridge, said second end being connected to a fusible member within the fuse.

4,109,228

CURRENT LIMITING FUSE WITH RESINOUS ARC-QUENCHING FILLER

Daniel A. Wycklendt, Milwaukee, and Martin Hudis, Wauwatosa, both of Wis., assignors to Electric Power Research Institute, Inc., Pala Alto, Calif.

Filed Apr. 18, 1977, Ser. No. 788,241
Int. Cl.[2] H01H *85/18*
U.S. Cl. 337—276 **5 Claims**



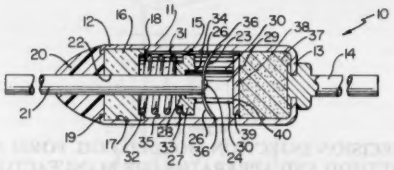
1. A current limiting fuse construction comprising a hollow casing of electric insulating material, electroconductive terminal elements carried by said casing and an elongate fuse element disposed electrically between said terminal elements for passing current therebetween, arc-quenching filler material within said casing, said filler material comprising a body of loose granular insulating material submerging the fuse element therein, substantially larger heat responsive gasevolving polymer resin particles relative to said granular material distributed substantially uniformly throughout said insulating material to increase the average arc gradient, said particles being vaporizable in response to heat for cooling an arc defined between ruptured portions of the fuse element while remaining substantially free of carbon after being so vaporized to preclude further conduction after vaporization thereof.

4,109,229

THERMALLY ACTUATABLE ELECTRICAL SWITCH SUBASSEMBLY THEREOF

Emil Robert Plasko, Washington Township; Montgomery County, Ohio, assignor to Emerson Electrical Co., St. Louis, Mo.

Filed Aug. 23, 1976, Ser. No. 716,579
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—408 **14 Claims**



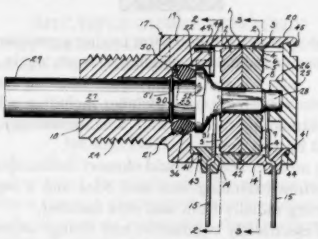
1. In a thermally actuatable electrical switch construction having a deformable contact member normally disposed in electrical contact with a stationary contact member while a temperature sensitive member of said construction is in a solid condition and being deformed out of contact with said stationary contact member by deforming means of said construction when said temperature sensitive member is rendered non-solid by sensing a temperature above a predetermined temperature, the improvement wherein said deformable contact member is deformed in a direction toward said temperature sensitive member by said deforming means when said temperature sensitive member is rendered non-solid, said deformable contact member being carried by a lead that projects into said construction and is secured thereto by an insulating end plug.

4,109,230

COMPACT ELECTRICAL CONTROL

Sydney W. Frey, Jr., Brookfield, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 16, 1977, Ser. No. 768,998
Int. Cl.[2] H01C *10/32*
U.S. Cl. 338—164 **3 Claims**



1. An electrical control comprising:

(a) a housing having a base portion, side walls extending rearward of the base portion to define a hollow interior, an annular seal cavity in the body portion having a circumferential wall and an axial end wall which opens upon the hollow interior, a bushing on the base portion opposite

said side walls and seal cavity, and a cover at the rear of said side walls with an internal bearing opening upon the housing interior and in alignment with said bushing;

(b) a shaft received in said bushing extending through said seal cavity, and with an end journal in said bearing, said shaft having a radial extending flange having a pressure face facing said seal cavity end wall to define the axial extent thereof;

(c) a rotary unit within said housing mounted on said shaft that is between said pressure face and said end journal;

(d) terminal members extending through said housing side walls with connection portions outside said housing and contact fingers within said housing engaging said rotary unit; and

(e) an annular, resilient seal having an axial length exceeding its radial thickness and circumferentially extending beveled faces, said seal being positioned in the seal cavity and axially compressed between the pressure face of the flange of said shaft and the cavity end wall to prevent shaft end play and radially compressed between the cavity circumferential wall and the shaft to provide liquid tight seals.

4,109,231

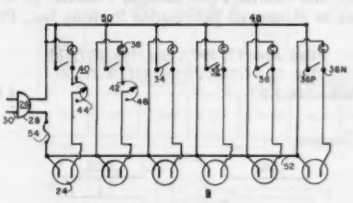
PORTABLE SWITCH AND DIMMER CONTROL CONSOLE

Robert S. Krouse, 2316 Manning St., Philadelphia, Pa. 19103

Filed Mar. 24, 1977, Ser. No. 780,921

Int. Cl.[2] H01C *10/50*

U.S. Cl. 338—200 **14 Claims**



1. A portable switch and dimmer control for controlling a plurality of electrically energized devices which comprises:

a casing;

control means mounted on said casing to manually control devices; and

an electrical control circuit operated by said control means, said control circuit comprising a plurality of individual fixture control circuits,

at least one variably resistant fixture control circuit, and

means for interchangeable electrical engagement of fixtures with said control circuit,

wherein at least some of the individual fixture control circuits and the variably resistant fixture control circuit are connected in parallel.

4,109,232

CORRECTION AND TRANSMISSION SYSTEM FOR DIRECTIONAL TARGET INFORMATION

Albert M. Bates, Southampton; Wayne H. Sandford, Jr., Warrington, and Anthony J. Madera, Doylestown, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 804,041

Int. Cl.[2] G01S *3/80*

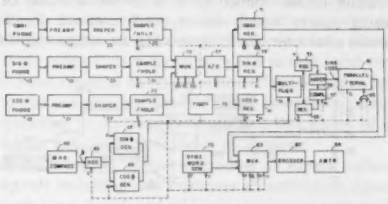
U.S. Cl. 340—6 R **12 Claims**

1. A system for correcting the bearing of a target from one reference to another, comprising:

first receiving means for alternately producing respective signals indicative of the sine and cosine of the bearing θ to the target from the one reference;

reference means for alternately producing respective signals indicative of the sine and cosine of the angular deviation ϕ between the references;

multiplying means synchronously receiving said sine θ, cosine θ, sine ϕ and cosine ϕ signals for producing signals indicative of sin θ sinϕ, cos θ cos ϕ, sin θ cos ϕ and cos θ sinϕ, respectively; and



adding means sequentially receiving the multiplying means signals for producing signals indicative of sine γ and cosine γ wherein $\gamma = \theta - \phi$.

4,109,233

PROXIMITY SENSOR

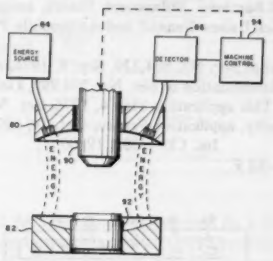
Clifford W. Erickson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 534,997, Dec. 20, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,091

The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.

Int. Cl.[2] H04B *11/00*

U.S. Cl. 340—15 **19 Claims**



1. A proximity sensor for sensing the presence of an object within a first spatial volume positioned between second and third spatial volumes, the proximity sensor comprising:

a beam resonant cavity wherein the beam resonant cavity comprises concave curved surfaces facing one another and separated from one another along an axis;

energy source means for introducing energy into the beam resonant cavity, substantially all of the energy resonating in a predetermined pattern within the first spatial volume; and

detector means for sensing a change in the resonant condition of the energy caused by the presence of an object in the pattern.

4,109,234

ANTI SKID FAULT DETECTION CIRCUIT

William F. Davis, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1976, Ser. No. 662,053

Int. Cl.[2] B60T *8/00*

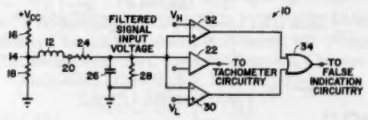
U.S. Cl. 340—52 B **5 Claims**

1. A fault detecting circuit for an anti-skid control system which is adapted to be operatively coupled to a sensing means thereof that includes a sensing coil, the fault detecting circuit

being suitable for detecting open circuit or either end shorted to ground conditions of the sensing coil, the fault detecting circuit comprising:

bias supply means connected to a first terminal of the sensing coil, said bias supply means buffering said first terminal from ground reference potential for providing a predetermined bias potential thereat;

first circuit means connected to a second terminal of the sensing means which has a predetermined frequency transfer characteristic for providing an output signal having an amplitude which is limited within a predetermined range under normal operating conditions of the anti-skid control system, said output signal being outside said predetermined range when either of said first and second terminal of the sensing coil is short circuited to said ground reference potential or said sensing coil is open circuited; and



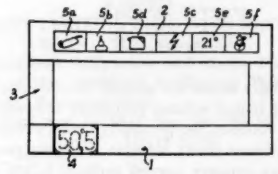
second circuit means connected to said first circuit means being responsive only to said output signal therefrom falling outside said predetermined range for sensing open or short circuit conditions of the sensing coil.

4,109,235

ELECTRONIC-DISPLAY INSTRUMENT PANELS FOR AUTOMOTIVE VEHICLES

Pierre Marcel Bouthors, Billancourt, France, assignor to Regie Nationale des Usines Renault and Automobile Peugeot, both of, France

Continuation of Ser. No. 504,239, Sep. 9, 1974, abandoned, which is a continuation of Ser. No. 294,997, Oct. 4, 1972, abandoned. This application May 4, 1976, Ser. No. 683,222
Claims priority, application France, Oct. 29, 1971, 71.39061
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—52 F **17 Claims**



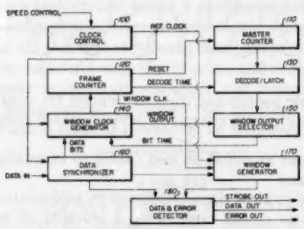
1. An electronic-display instrument panel for motor vehicles, adapted to display values of data signals emitted from sensing devices detecting various parameters of functions and physical conditions, comprising a frame and at least first and second small display panels incorporated in the frame, a signal pulse counter, the first display panel comprising a luminous digit display means connected to said counter for displaying values of counted pulses, the second display panel comprising conventional symbol designs and means for illuminating said designs, said symbol designs being associated with the displayed values, said instrument panel further comprising a clock member connected to said counter for emitting constant periodic signals during which pulses received by said counter are counted, a plurality of means connected to said sensing devices for converting voltages of data signals emitted by said sensing devices into other signals to be transmitted to said counter, said converting means including a first means for converting the voltage of the signals of a first sensing device emitting frequency pulses, and a plurality of second means for converting the voltage of signals of the other sensing devices concerning a plurality of parameters, a first switching member, connected to said first means for converting, for transmitting to said counter data concerning a single function parameter and on request data concerning sequences of different parameters, a multiple second switching member having a plurality of switches which are connected to said plurality of second means for converting and said second display panel, a third means connected to said first and second switching members and to said clock member for converting into frequency pulses the voltage of signals transmitted by said second means for converting, means for selecting data sequences concerning a plurality of parameters of functions and physical conditions and connected to said clock member and to said first and second switching members, means connected to said sequences selecting means for starting on request under the control of the vehicle driver switching of different data sequences, means connected to said luminous display means for adjusting the luminous intensity of the display on said first display panel, and means connected to said second means for converting the voltage of signals of sensing devices and to said second multiple switching member for energizing by priority alarm devices when predetermined thresholds of the values displayed for various parameters are overstepped.

4,109,236

APPARATUS FOR DIGITAL DATA RECOVERY FROM MASS STORAGE DEVICES

Edward Roald Besenfelder, Phoenix; Steve Garner Cantrell, Glendale, and Charles Peter Cobeen, Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jun. 17, 1977, Ser. No. 807,711
Int. Cl.[2] G11C *29/00*; G11B *27/00*
U.S. Cl. 340—146.1 F **4 Claims**



1. A digital data recovery apparatus for mass storage devices comprising:

a programmable clock control circuit for providing a reference clock output;

a data synchronizer connected to said clock control circuit and a data input signal for providing an output data signal synchronized with the reference clock, a data two output signal indicating a logic "1" to logic "0" transition of the data input, and a signal clock synchronized with the reference clock, one of said signal clocks being generated for each transition of the data input;

a window clock generator connected to said clock control circuit and data synchronizer for providing a signal clock +3 signal and a plurality of output signals for determining the number of reference clocks that have occurred since the previous signal clock;

a window output selector connected to the window clock generator for selecting a one of the plurality of output signals from said window clock generator;

a frame counter connected to said window clock generator, said frame counter for providing a window clock output, a count up output, a load reset output, and a reset output and having programmable means for varying the number

of signal clock +3 pulses necessary to generate the load-reset output signal;

a master counter connected to said frame counter for accumulating the number of count up pulses generated during a preprogrammed number of data frames called for by the frame counter;

a decoder/latch connected to said load reset output and to said master counter for providing a plurality of output signals to the window output selector, said output signals selecting a one of the output signals of the window clock generator;

a window generator connected to said clock control circuit, said data synchronizer, and said frame counter for providing a phase time output and a data time output; and,

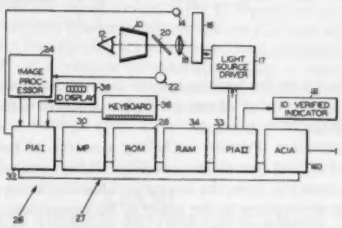
a data and error detector responsive to the phase-time and data-time outputs from said window generator and the synchronized data from the data synchronizer for providing a data output and an error output.

4,109,237

APPARATUS AND METHOD FOR IDENTIFYING INDIVIDUALS THROUGH THEIR RETINAL VASCULATURE PATTERNS

Robert B. Hill, P.O. Box 2006, Longview, Wash. 98632

Filed Jan. 17, 1977, Ser. No. 759,901
Int. Cl.[2] G06K *9/00*; A61B *3/10*
U.S. Cl. 340—146.3 E **14 Claims**



1. The method of identifying a person by his retinal vasculature pattern comprising:

(a) scanning an eye of the person with a light source arranged in a selected pattern,

(b) detecting that portion of the light source pattern which is reflected from the retina of the eye,

(c) locating each intercept of the light source pattern with a blood vessel in the retina, thereby creating an intercept pattern of the retina, and

(d) comparing said intercept pattern with a reference intercept pattern, and thereby determining the identity or non-identity of the same.

4,109,238

APPARATUS FOR VERIFYING CHECKS PRESENTED FOR ACCEPTANCE

Robert V. Creekmore, E. Marietta, Ga., assignor to 1st Natl. Bank of Atlanta, Atlanta, Ga.

Filed Oct. 6, 1975, Ser. No. 619,663
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 340—149 A **7 Claims**

1. System for verifying the check presentation history of a number of persons who may present various types of checks for acceptance, irrespective of their current checking account status or availability of such persons, comprising:

at least one input terminal disposed at a location where checks may be presented for acceptance by customers;

said input terminal having means operative to accept and read any of a plurality of customer identification cards each of which contains machine-readable information corresponding to an individual customer and also operative to produce a customer identification signal in the input terminal;

said input terminal having variable data entry means operable by the customer to provide a code input signal corresponding to a predetermined personal code whic has been previously selected by the customer;

said input terminal having form handling means operative to receive a customer-supplied form suitable for imprinting;

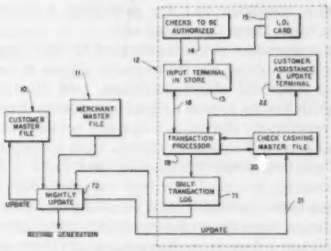
said input terminal having means operative to print authorization indicia on said customer-supplied form in response to an authorization signal supplied to said input terminal;

said input terminal having function selection means operable by the customer to provide check category signals corresponding to certain predetermined categories of checks which may be presented for acceptance;

data transmission means operative to supply information signals including said customer identification signal, said code input signal, and said category signal from said input terminal to a remote location;

transaction processing means disposed at said remote location and connected to receive information signals from said data transmission means;

said transaction processing means including information storage means operative to provide stored signals corresponding to the predetermined personal code previously selected by each customer, corresponding to certain previously authorized categories of checks which will be



approved for acceptance if presented by a particular customer, and corresponding to a predetermined maximum number of times each such authorized category may be approved for acceptance for particular customers within a certain period of time;

said transaction processing means including signal processing means responsive to said stored signals and to said information signals received along said data transmission means from an input terminal to compare the personal code input signal from the input terminal with the stored predetermined personal code signal for that customer, said transaction processing means being operative in response to a comparison showing nonidentity of said input and stored personal code signals to provide a code error signal for transmission along said data transmission means to that input terminal; and

said transaction processing means including means operative in response to a comparison showing identity of said input and stored personal code signals to compare a received desired check category signal with said stored signals in said information storage means to provide an authorization control signal indicating whether or not said desired category is authorized for that customer and whether the present request for acceptance will exceed said predetermined maximum utilization of such category; and

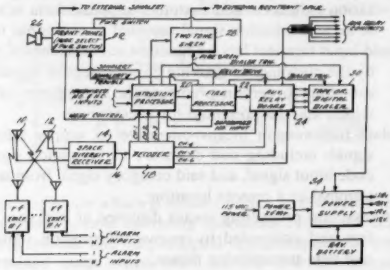
means operative to transmit said authorization control signal to said input terminal.

4,109,239

RADIO FREQUENCY ALARM SYSTEM INCLUDING TRANSMITTING, CODING AND DECODING CIRCUITRY

Glenn A. Davis, Lilburn, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Sep. 30, 1975, Ser. No. 618,239
Int. Cl.[2] G08B 1/08
U.S. Cl. 340—539 **16 Claims**



1. An alarm system for signalling at a central receiving location one of a plurality of possible alarms transmitted thereto by a plurality of remotely located alarm sensing and transmitting units, said system comprising:

a plurality of remotely located alarm sensing and transmitting units, each such unit comprising

at least one sensor means for sensing a predetermined alarm condition and for providing a corresponding electrical alarm condition, and

radio transmitter means connected to said sensor means for transmitting electromagnetic signals in response to said electrical alarm condition, said electromagnetic signals having at least a signal component thereof which is repetitively shifted in frequency between at least first and second frequencies chosen from among a plurality of predetermined frequencies, said shifts in frequency occurring at a predetermined switching rate,

receiving means at said central receiving location including a radio receiver means for receiving said electromagnetic signals and a decoder means connected thereto for detecting the presence of said at least two predetermined first and second frequencies as well as for detecting the switching rate therebetween and for then producing a corresponding alarm output only if both of said first and second predetermined frequencies and said predetermined switching rate are concurrently present;

said decoder means comprising

a first plurality of frequency detectors, each adapted to detect a respectively corresponding one of said plurality of predetermined frequencies if present in said signal component of the electromagnetic signals and to produce a corresponding signal at its output in response thereto,

switching rate detection means connected between the outputs of said first plurality of frequency detectors for producing an output signal in response to detection of said predetermined switching rate, and

logic means connected to receive the outputs of said first plurality of frequency detectors and of said switching rate detection means for producing an alarm output respectively representative of a particular one of a plurality of possible alarms corresponding to said first and second frequencies and to said predetermined switching rate;

said switching rate detection means comprising

a bistable means connected for setting to a first stable state in response to an output from a predetermined one of said first plurality of frequency detectors and for resetting to a second stable state in response to an output from any other one of said first plurality of frequency detectors thereby producing an output signal having a frequency representative of the switching rate in said signal component of the electromagnetic signals between a first frequency corresponding to said predetermined frequency detector and a second frequency corresponding to one of the other frequency detectors, and

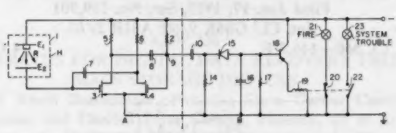
second frequency detector means connected to receive the output signal from said bistable means and to produce an output when a predetermined frequency corresponding to said predetermined switching rate is detected.

4,109,240

IONIZATION-TYPE FIRE SENSING SYSTEM

Andreas Scheidweiler, Uerikon, Switzerland, assignor to Cerberus AG., Mannedorf, Switzerland

Continuation-in-part of Ser. No. 525,969, Nov. 21, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 741,750
Claims priority, application Switzerland, Nov. 26, 1973, 16598/73; Oct. 14, 1976, 13037/76
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—629 **20 Claims**



1. Smoke or fire sensing system to provide an alarm output signal upon sensing of smoke or fire aerosols within a supervised space having

an ionization chamber including a source of radiation (R) and at least two electrodes (E1, E2) between which an ion current can flow, the ionization chamber being exposed to the atmosphere in the space to be supervised,

and an evaluation circuit (A, B) connected to the ionization chamber and responsive to change in ion current flow of the ionization chamber when smoke or fire aerosols penetrate the chamber,

wherein the evaluation circuit comprises

two field effect transistors (FET's) (3, 4), each having a source electrode, a drain electrode and a gate electrode;

two drain resistors (5, 6) and two gate resistors (1, 2), the drain and gate resistors, respectively, being connected to respective FET's (3, 4);

two cross-connected capacitors (7, 8), one capacitor, each, being respectively connected to the drain electrode of one FET and to the gate electrode of the other FET to provide a cross-connecting feedback path and connect said FET's in a multivibrator oscillator circuit providing for generation of a pulse train formed by cyclically recurring pulses, the pulse repetition rate (PRR) of said pulse train depending on the value of the respective drain and gate resistors (1, 2; 5, 6);

at least one of said resistors being formed by the ionization chamber to change the pulse repetition rate of the multivibrator oscillator circuit upon presence of smoke or fire aerosols in the supervised space, and hence in the ionization chamber;

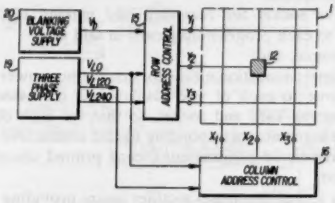
a pulse rate detector connected to the drain electrode of one of the FET's including summing means (16, 17) summing the pulses delivered from the multivibrator oscillator circuit during a predetermined time interval;

and an alarm response circuit (18, 19, 20,22; 21, 23) providing an alarm output signal when the sum of the pulses in the predetermined time interval changes from a predetermined value.

4,109,241
LIQUID CRYSTAL DISPLAYS

Ian Alexander Shanks, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of Great Britain and Northern Ireland, London, England

Filed Dec. 10, 1975, Ser. No. 639,434
Claims priority, application United Kingdom, Dec. 11, 1974, 53685/74
Int. Cl.² G02F *1/13*
U.S. Cl. 340—324 M **9 Claims**

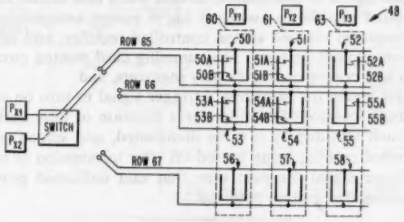


1. A liquid crystal display comprising a layer of liquid crystal material contained between two slides at least one of which is transparent, the slides carrying spaced electrodes arranged to provide a plurality of intersections whereby the display can be addressed in matrix form, and further comprising means for applying across the liquid crystal layer at a plurality of electrode intersections a blanking voltage to turn the layer into an on state, means for applying across selected intersections previously turned on a voltage substantially below a threshold voltage level to turn the layer at those selected intersections to an off state, and means for applying to the layer at electrode intersections, a voltage close to a threshold value at other times.

4,109,242
MATRIX ADDRESS SYSTEM USING ERASE OPERATION

Donald Jones Channin, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 13, 1977, Ser. No. 758,995
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **11 Claims**



1. In a display device of the type including a plurality of liquid crystal electro-optical elements interconnected into rows and columns and addressing means for generating a first predetermined optical information response in selected ones of said elements in a selected row, and a second predetermined optical information response in non-selected elements of said selected row,

said elements being excited in accordance with a predetermined excitation characteristic in response to excitation signals applied thereto and being erased in accordance with a predetermined erase characteristic in response to erase signals applied thereto, the improvement wherein

said elements are of a type having an erase characteristic that is non-linear with respect to changes in applied erase signals; and

said addressing means comprises:

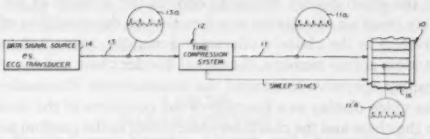
means for applying an initial excitation signal to all elements in said selected row to generate in said elements an initial excitation response;

means for applying, subsequent to the application of said initial excitation signal to said selected row, a first erase signal to said selected elements and a second erase signal to said said elements, and first erase signal effecting in said selected elements said first predetermined optical information response and said second erase signal effecting a differing amount of erasure than said first erase signal to generate in said non-selected elements said second predetermined optical information response.

4,109,243
DATA SEQUENCE DISPLAY SYSTEM AND TIME-COMPRESSION SYSTEM THEREFOR

Christopher Cameron Day, Newtonville, and Robert Lee Cannon, Waltham, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 26, 1976, Ser. No. 680,017
Int. Cl.² G06K *15/18*
U.S. Cl. 340—324 R **14 Claims**



1. A system for the cyclical time-compression of a signal waveform comprising:

a recirculating memory of predetermined time-quantized length, said memory providing a storage delay corresponding with the product of said predetermined time-quantized length and the number of passes through said memory;

means having successive samples of the signal waveform extended thereto and being responsive to first timing signals for entering respective said samples of the signal waveform into said memory;

means for generating and applying a plurality of said first timing signals to said data entry control means throughout a time-compression cycle, said first timing signals recurring at an interval corresponding with the interval between successive samples of the signal waveform, said first timing signals having an interval such as to cause precession of the samples in the memory, and a predetermined number of the samples being entered in said memory during a first fraction of each time-compression cycle;

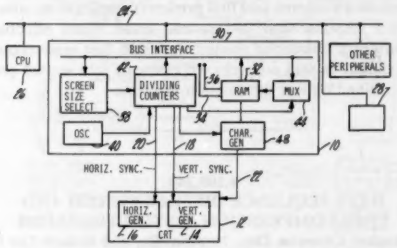
means responsive to second timing signals for selectively interrogating said memory and providing read out of the respective interrogated samples; and

means for generating and applying said second timing signals to said memory interrogation means following a time delay comprising said first fraction of each time-compression cycle, the remaining fraction of each said time-compression cycle being a compressed-time cycle in which the timing of said second timing signals is such that the storage delay of said recirculating memory is decremented from a maximum to a minimum over said compressed-time cycle whereby said interrogated samples cumulatively substantially represent the signal waveform in time-compression.

4,109,244
DIGITAL PROCESSOR FOR GENERATING ALPHANUMERIC DISPLAY ON A CATHODE RAY TUBE

Richard G. Barnich, Grand Blanc, and Timothy M. Hakeem, Pinckney, both of Mich., assignors to Process Computer Systems, Inc., Saline, Mich.

Filed Sep. 8, 1976, Ser. No. 721,285
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—324 AD 10 Claims

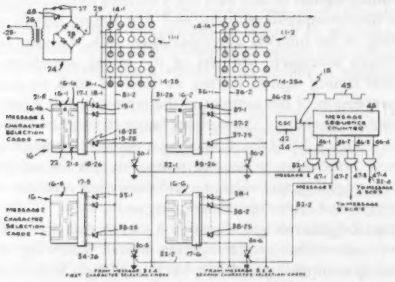


1. A video display system comprising: a random access memory storing a plurality of character codes; a video display device; an oscillator; a chain of digital dividers connected to the output of the oscillator; horizontal and vertical position generators connected to points in the digital divider chain and to the video display device to control the position of the display point on the device as a function of the condition of the dividers in the chain; a character generator connected to the random access memory, the digital divider chain and the video display operative to control the instantaneous illumination of the video display as a function of the condition of the dividers in the chain and the character code stored in the random access memory; and a memory counter connected to the digital chain and operative to control the character code provided by the random access memory to the character generator as a function of the condition of the dividers in the chain.

4,109,245
PROGRAMMABLE ELECTRONIC SIGN

Robert A. Hedin, 41272 Village Lake Rd., Novi, Mich. 48050

Filed Feb. 17, 1976, Ser. No. 658,484
Int. Cl.[2] G09F 9/32
U.S. Cl. 340—334 5 Claims



1. A programmable electronic sign, comprising: a set of individual character displays mounted in alignment to form a sign, each display having a plurality of illuminable segments which when selectively energized form an image of a selected character;

a corresponding set of selectable programming cards each associated with a respective one of said displays, each card containing indicia designating the specific segments to be illuminated in the associated display to produce on that display a character defined by that card;

means utilizing said set of programming cards and interconnected with said displays for energizing in each display only the segments specified by the associated program card, each display thereby containing an illuminated image of the defined character, the characters together forming a selected message;

each of said programming cards contains a printed circuit having conductive strips corresponding to display segments to be illuminated, and wherein said means for energizing comprises;

a respective socket for receiving and making electrical contact to each programming card in said set,

a power source, and

electrical interconnection means for connecting power from said source to each of said displays via the associated programming card and socket, so that for each display only the segments corresponding to said conductive strips in the associated programming card printed circuit are energized;

said power source comprises rectifier means providing unfiltered, rectified ac power and wherein said electrical interconnection means includes a silicon controlled rectifier in circuit with each programming card, so that power is supplied to the display segments via that silicon controlled rectifier and the associated programming card printed circuit, and trigger means for providing a trigger signal to said silicon controlled rectifiers for substantially the entire duration of time that the characters selected by said programming cards are to be displayed, said silicon controlled rectifiers going off at the end of the ac half cycle next following termination of said trigger signal as said unfiltered power approaches ground potential;

each of said displays comprises an $n \times m$ matrix of lamps, wherein

said programming card printed circuit has a common contact and ($n \times m$) other contact locations, said circuit having a conductive path extending from said common contact to those contact loctions corresponding to display segments to be illuminated,

wherein said common contact is connected via said socket to a silicon controlled rectifier, all of the other contact locations being connected via said socket to respective segments of the associated display,

a source of unfiltered, rectified ac power connected to all of said segments, said silicon controlled rectifier being in the return path to said source, so that when said silicon controlled rectifier is switched on, a power connection is completed via said silicon controlled rectifier, said common contact, and said programming card printed circuit to said corresponding display segments, and

trigger means for providing a trigger signal to turn on said silicon controlled rectifier for a duration of time during which said display is to be illuminated, said silicon controlled rectifier being turned off after termination of said trigger signal the next time that said unfiltered power approaches ground potential.

4,109,246
ALARM SYSTEM WITH REPEAT OF ALARM INTERRUPTED FOR PRIORITY ALARM

Ignas Budrys, Bethel, and Robert W. Right, Huntington, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

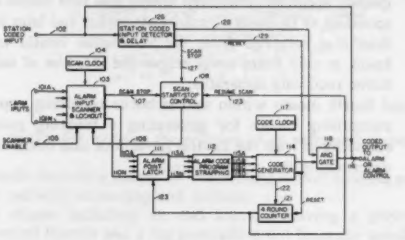
Filed Jun. 29, 1976, Ser. No. 700,939
Int. Cl.[2] G08B 19/00
U.S. Cl. 340—518 9 Claims

1. An alarm annunciator for responding to signals indicative of predetermined conditions on any one of a plurality of alarm input leads and for activating a code generator to generate a unique code indicative of the one of the plurality of alarm input

leads on which the signal was received and comprising in combination:

(a) a station coded input lead coupled to said alarm annunciator and on which a distinctive code signal is transmitted for a limited period of time in response to a predetermined nonstandard condition;

(b) priority means responsive to the initiation of transmission of said distinctive code signal on said station coded input lead for terminating the generation of any unique code being generated in response to a signal on any one of said



plurality of alarm input leads and for transmitting the distinctive code signal received on said station coded input lead; and

(c) control means coupled to said priority means and responsive to the conclusion of the transmission of said distinctive code signal received on said station coded input lead for initiating the resumption of the unique code terminated in response to the initiation of said distinctive code signal on said station coded input lead irrespective of the then current status of said nonstandard condition.

4,109,247

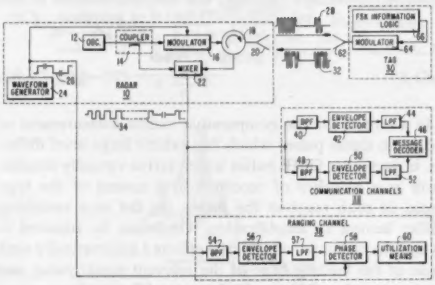
CLUTTER FREE COMMUNICATIONS RADAR

Gerald Stanley Kaplan, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 593,120, Jul. 3, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,337

Int. Cl.[2] G01S *9/56, 9/58*

U.S. Cl. 343—6.5 R **2 Claims**



1. In a system for detecting the presence and range of a cooperating remote unit from an interrogating station in an environment of non-cooperating objects, said interrogating station transmitting a modulated interrogation signal at one particular carrier frequency for reception at said remote unit, said interrogation signal being modulated in accordance with a predetermined waveform, said remote unit, in response to said interrogation signal, radiating back to said interrogating unit at said one particular carrier frequency an information bearing reply signal, said reply signal being modulated in accordance with any one of a plurality of signals having differing predetermined frequencies, each of said predetermined frequencies being representative of a given value of said information at said remote unit, said non-cooperating objects, in response to said interrogation signal, radiating back to said interrogating station, skin-reflections of said interrogation signal, said interrogating station comprising:

first means for transmitting said modulated interrogation signal, including means for generating a sample signal indicative of said one particular carrier frequency;

second means comprising a mixer, responsive to said reply signals, said skin-reflections, and said sample signal, for generating a difference signal having distinguishable components respectively representative of said reply signals from said remote unit and said skin-reflections from said non-cooperating objects;

said component representative of said reply signals having characteristics respectively indicative of said information and the range between said remote unit and said interrogating station;

third means comprising a plurality of channels each of which includes a bandpass filter (BPF) receptive of said difference signal, each center-tuned to a respective one of said predetermined frequencies, said third means also comprising means receptive of the respective output signals of said BPFs for determining the presence of the respective predetermined frequencies for extracting thereby said information from said reply signal; and

fourth means comprising an additional BPF receptive of said difference signal for passing a signal having a band of frequencies essentially equal to the total bandwidth of all of said respective third means BPFs and further comprising means cooperating with said additional BPF for detecting said characteristic indicative of said range for determining the range between said remote unit and said interrogating station.

4,109,248

RADAR SYSTEMS

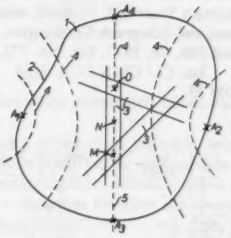
Philip Neville George Knowles, Aldwick, and Christopher Pell, Horndean, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Aug. 27, 1975, Ser. No. 608,214

Claims priority, application United Kingdom, Aug. 28, 1974, 37504/74; Jun. 14, 1975, 25484/75

Int. Cl.[2] G01S *9/56*

U.S. Cl. 343—6.5 R **17 Claims**



1. A method of selectively interrogating secondary surveillance radar transponders carried by vehicles located within a predetermined ground area for the purpose of identifying and locating those vehicles within that ground area, the method comprising the steps of radiating a first pair of interrogate pulses to cause the transponders located in a band of said area to be interrogated, determining the position of a required one of said transponders, radiating pairs of suppression pulses to cause all but a required one of the transponders in said band to be suppressed, radiating a second pair of interrogate pulses to cause the required one of said transponders to be interrogated and receiving the reply transmitted from the said one transponder for identification and location purposes.

5. Apparatus for selectively interrogating secondary surveil-

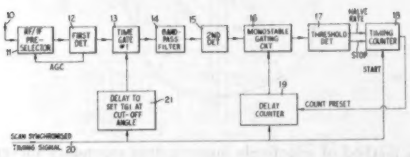
lance radar transponders carried by vehicles located within a predetermined ground area for the purpose of identifying and locating those vehicles within that ground area comprising means for radiating a first pair of interrogate pulses to cause the transponders located in a band of said area to be interrogated, means for determining the position of a required one of said transponders, means for radiating pairs of suppression pulses to cause all but a required one of the transponders in said band to be suppressed, means for radiating a second pair of interrogate pulses to cause the required one of said transponders to be interrogated and for receiving the reply transmitted from the said one transponder for identification and location purposes, wherein said means for radiating a first pair of interrogate pulses include first and second aerials, and means for positioning said first and second aerials on the perimeter of the predetermined area in spaced apart relationship, and said means for radiating pairs of suppression pulses include a third aerial, and means for positioning said third aerial on the perimeter of said area.

14. Apparatus for selectively interrogating secondary surveillance radar transponders carried by vehicles located within a predetermined ground area for the purpose of identifying and locating those vehicles within that ground area, comprising means for radiating a first pair of suppression pulses for causing transponders located in a first band of said area to be suppressed for a first predetermined period, means for radiating a second pair of suppression pulses to cause all the remaining transponders located within the predetermined area to be suppressed for a second predetermined period, means for radiating a pair of interrogate pulses after the expiration of said first period but before the expiration of said second period in a second band of said area which is transverse to said first band to be interrogated for causing the transponders located in said second band of said area that is common with said first band of said area to be interrogated, wherein said means for radiating a first pair of suppression pulses comprise first and second aerials, and means for positioning said first and second aerials on the perimeter of the predetermined area in spaced apart relationship, and wherein said means for radiating a pair of interrogate pulses comprise third and fourth aerials, and means for positioning said third and fourth aerials on the perimeter of said predetermined area in spaced apart relationship, and spaced from the first and second aerials.

4,109,249
SCANNING BEAM RECEIVER

Paul Barton, Bishop's Stortford, England, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,551
Int. Cl.[2] G01S *1/16, 1/54*
U.S. Cl. 343—108 M **4 Claims**



1. In an air navigation system in which a ground based equipment scans a colimated beam of radio frequency energy over a predetermined sector of space in at least one angular coordinate and also transmits a phase-coherent reference signal offset from the frequency of said beam and a timing signal identifying a corresponding predetemined instantaneous angle of said beam scan and including airborne receiving apparatus for determining a navigational angle within said angular coordinate with respect to said ground station in accordance with the elapsed time between reception of said timing signal and said scanning beam, comprising:

first means comprising a receiver responsive to said phase-coherent, frequency-offset reference signal and to signals of said beam received as said beam scans across the location of said airborne receiving apparatus for coherently detecting said beam signals to produce a first detected signal;

second means within said airborne receiving apparatus responsive to said timing signal for inhibiting the output of said first means for angles of said scanning beam outside a predetermined limit angle;

third means comprising a bandpass filter responsive to said second means for suppressing that portion of the frequency spectrum generated within said first means corresponding to Doppler Components earlier and later in time than that received from the substantial center of said beam, as said beam scans across the location of said airborne receiving apparatus;

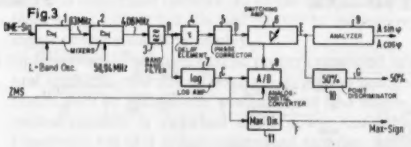
and fourth means within said airborne receiving apparatus comprising means for generating a tracking gate surrounding at least the central portion of said beam and for determining the center thereof.

4,109,250
CIRCUIT FOR THE COMPARATIVE VECTOR MEASUREMENT OF RADIO SIGNAL PULSES WHICH ARRIVE APPROXIMATELY SIMULTANEOUSLY IN A PLURALITY OF RECEIVERS

Erwin Vachenauer, Haar, and Bernd Mueller, Poecking, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 23, 1976, Ser. No. 753,884
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1976, 2600687
Int. Cl.[2] G01S *5/06*
U.S. Cl. 343—112 R **10 Claims**

Fig.3



1. In a circuit for the comparative vector measurement of keyed radio signal pulses which can exhibit large level differences, in particular DME pulses which arrive virtually simultaneously at a plurality of receivers in a system of the type wherein, in each receiver the pulses are fed to a switching amplifier having an amplification which can be adjusted in steps and the reduction of which is effected automatically with the rise of the leading edge of the relevant signal pulse, and wherein when the relevant switching amplifier has been passed through by a signal pulse and at a specific measuring time for all the receivers the instantaneous amplitudes and instantaneous phases of the measuring signals are measured, the improvement comprising:

a delay device connected ahead of the switching amplifier for receiving and delaying the signal pulses for a predetermined interval;

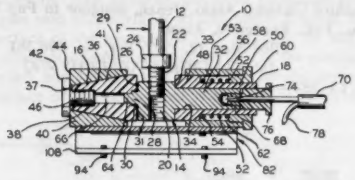
a logarithmic amplifier connected to also receive the undelayed signal pulses; and

an analog-digital converter connected to said logarithmic amplifier and to the switching amplifier to adjust the amplification thereof prior to receipt of the delayed signal pulses.

4,109,251
ADJUSTABLE ANTENNA MOUNTING BRACKET

James B. MacDougall, 236 E. Wood St., New Lenox, Ill. 60451

Filed Jul. 8, 1976, Ser. No. 703,615
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—715 11 Claims

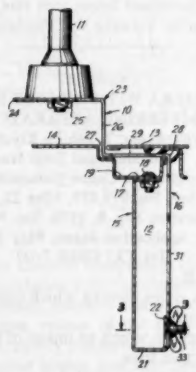


1. A device for varying the position of an antenna comprising:
- a spindle including means for connecting to said antenna and an outward extending rod portion;
- lock means including an end member having a groove formed therein and a lug protruding out from the spindle for engagement with the groove for locking the spindle at the fixed position, the position of the groove determining the fixed position;
- a spring for retaining said lug in said groove, said spindle being movable in the direction for compressing said spring when the spindle is in said fixed position, said lug being dis-engaged from the groove upon the application of an external force for sufficiently compressing said spring;
- a cylindrical member having an opening for receiving said rod portion and including an outer collar; and
- a wall, said spring being positioned between the collar and the wall, the movement of the rod portion toward the spring causing said cylindrical member to move responsively for compressing the spring, for unlocking the spindle from the fixed position to enable said spindle to be rotated away from the fixed position for moving the antenna to a non-operative position.

4,109,252
ANTENNA MOUNT ATTACHED TO VEHICLE TRUNK INTERIOR

Morris Hacker, Bayside, and Dominick Padilla, Bronx, both of N.Y., assignors to RMS Electronics, Inc., Bronx, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,575
Int. Cl.[2] H01Q 1/32
U.S. Cl. 343—715 4 Claims

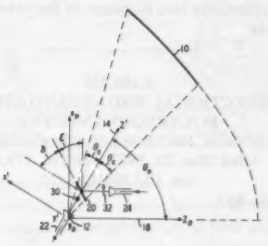


1. An antenna mount, which comprises:
(a) a bracket member to be received within the trunk of a vehicle and having a first mounting flange adapted to be secured to the rain channel of the trunk and a second mounting flange integral therewith adapted to be generally vertically disposed and having at least one rib or groove element extending longitudinally thereof;
(b) a separable mounting member to extend from outside of the vehicle, beneath the closed lid of the vehicle trunk and inside the trunk, and comprising a first, mount section for mounting an antenna outside of the vehicle, and a second, support section having at least one rib or groove element extending longitudinally thereof and adapted to be generally vertically disposed within the vehicle trunk and aligned with the rib or groove element on the bracket member;
(c) bolt means extending through the second mounting flange of the bracket member and the support section of the mounting member; and
(d) nut means for engaging the bolt means and releasably securing the mounting member to the bracket member with the rib and groove elements on the respective mounting flange and support sections thereof engaging one another and thereby preventing both longitudinal and lateral movement of said members relative to one another when the antenna mount is disposed to mount an antenna to the vehicle.

4,109,253
METHOD AND APPARATUS FOR SUBSTANTIALLY REDUCING CROSS POLARIZED RADIATION IN OFFSET REFLECTOR ANTENNAS

Ta-Shing Chu, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 22, 1977, Ser. No. 770,392
Int. Cl.[2] H01Q 19/06, 15/22
U.S. Cl. 343—756 4 Claims



2. A cross polarization suppressed offset antenna arrangement comprising:
- a curved focusing offset main reflector which inherently introduces cross polarization components in a beam of polarized electromagnetic radiation when reflecting said beam in either direction between the aperture and a first focal point thereof; and
- a polarization grid comprising a plurality of parallel spaced-apart elements disposed both between the offset main reflector and the first focal point along the feed axis of said beam of electromagnetic radiation and at an angle to a plane normal to the feed axis of said beam which approximates one-half of the magnitude of the angle between said feed axis and the axis of the offset main reflector, the elements of the polarizing grid being arranged to pass therethrough the electromagnetic radiation polarized in a first direction and to reflect electromagnetic radiation polarized in a second direction orthogonal to said first direction and propagating in said beam between the main reflector and a second focal point while concurrently introducing cross polarization components which are both approximately equal and of opposite sign to the cross

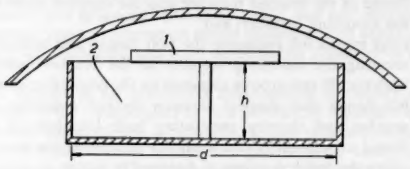
polarization components introduced by said main reflector to effect overall cross polarization cancellation.

4,109,254

DIPOLE RADIATORS FOR FEEDING A PARABOLIC REFLECTOR

Edmund Wergiliusz Woloszczuk, Chelmsford, England, assignor to The Marconi Company Ltd., Chelmsford, England

Filed Sep. 20, 1976, Ser. No. 724,554
Claims priority, application United Kingdom, Sep. 20, 1975, 38682/75; Dec. 1, 1975, 49345/75
Int. Cl.[2] H01Q *21/26*
U.S. Cl. 343—797 **13 Claims**



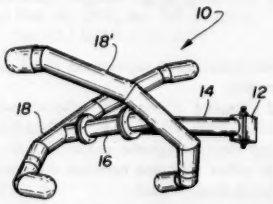
1. A dipole radiator which comprises, in combination:
a shallow cavity presenting a mouth;
two crossed half wave dipole radiators disposed near said mouth of the shallow cavity and each consisting of two elements; and
means for feeding said dipole elements with r.f. energy, said means comprising a metal rod having four longitudinally extending slots therein dividing said rod, for a portion of its length, into four parts, two of said parts being connected to the respective two elements of one of said dipole radiators and the other two of said parts being connected to the respective two elements of the other of said dipole radiators.

4,109,255

OMNIDIRECTIONAL BROADBAND CIRCULARLY POLARIZED ANTENNA

Thomas B. Silliman, 108 Market St., Newburgh, Ind. 47630

Filed Mar. 21, 1977, Ser. No. 779,619
Int. Cl.[2] H01Q *1/36*
U.S. Cl. 343—853 **5 Claims**



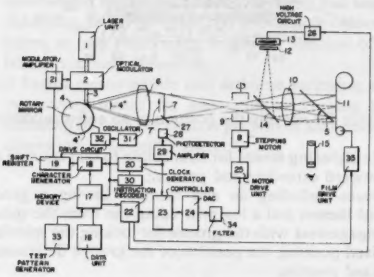
1. A circularly polarized antenna comprising
a first arcuate half loop radiating element approximately λ/2 in length;
a second arcuate half loop radiating element approximately λ/2 in length; each of said radiating elements consisting of a long hollow electrically conductive member and a short hollow electrically conductive member isolated from each other by an insulator;
radiating element coaxial feed line means within each said long conductive member having a center conductor electrically connected to said short conductive member;
said half loops positioned with their mid points opposite each other and the ends of the half loops oriented inwardly relative to a circumscribing cylinder, the plane of said half loops being at an angle to each other; and
means for feeding said center conductors 180° out of phase.

4,109,256

LASER COMPUTER OUTPUT MICROFILMER

Masahiro Ohnishi, Asaki, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 12, 1977, Ser. No. 796,281
Int. Cl.[2] G03B *41/00*; G01D *9/42*
U.S. Cl. 354—4 **4 Claims**



1. In a laser driven computer output microfilmer including a laser source, means for modulating the intensity of the output beam from the source in accordance with an input data pattern, a first rotatable mirror for repetitively deflecting the modulated beam in a first scanning direction, a second rotatable mirror for deflecting the beam in a second scanning direction, means for synchronizing the rotation of the second mirror with that of the first mirror, whereby the output beam is doubly deflected in a full frame scanning mode, and means for recording the modulated and doubly deflected output beam on a recording medium, means for monitoring the optical registration, focusing, intensity, of the beam, comprising:
a. step-operable drive means coupled to said second mirror,
b. means for generating a test pattern signal defining character images occupying only a portion of the full scanning frame, said signal including an instruction signal for controlling said drive means in a multi-step manner to skip the beam over the remaining, unoccupied portion of the frame,
c. means coupling said test pattern signal to said intensity modulating means,
d. means coupling said instruction signal to said drive means, whereby a partial frame test pattern is repetitively displayed at an increased frame scan rate, and
e. optical means for viewing said displayed test pattern.

4,109,257

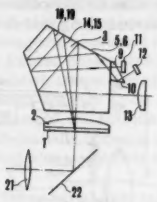
REFLEX CAMERA WITH A BUILT-IN EXPOSURE METERING APPARATUS

Youichi Okuno, Yokohama; Takehiko Kiyohara, Zama; Tokuichi Tsunekawa, Yokohama, and Teiji Hashimoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo

Continuation of Ser. No. 579,879, May 22, 1975, abandoned.
This application Sep. 8, 1976, Ser. No. 721,368
Claims priority, application Japan, May 31, 1974, 49-61542
Int. Cl.[2] G03B *7/00*
U.S. Cl. 354—23 R **7 Claims**

1. A single lens reflex camera which comprises:
an objective lens;
a focusing screen on which an image of an object is formed by said objective lens;
a pentagonal roof prism which has a entrance surface, two roof surfaces, a front reflection surface and an exit surface;
an eyepiece facing the exit surface of the pentagonal roof prism;

an optical means having a first surface, a second surface and a third surface, said third surface being a total reflection surface, said first surface being cemented on the upper portion of the exit surface of the pentagonal roof prism, so that a light beam entering the entrance surface of the pentagonal roof prism from the focusing screen and reflected by the roof surfaces, the front reflection surface and again said roof surfaces to said upper portion of the exit surface of the pentagonal roof prism at an angle of total reflection can pass said exit surface of the pentagonal roof prism, and wherein said light beam having passed the exit surface of the pentagonal roof prism is reflected by



said third surface of said optical means, said second surface having no total reflection angle with respect to a light beam coming from said third surface of said optical means and wherein a light beam entering the entrance surface of the pentagonal roof prism from the focusing screen and reflected by the roof surfaces and the front reflection surface to said upper portion of the exit surface of the pentagonal roof prism is passed through said first and second surfaces directly; and

photo detecting means to which a light beam passing through said second surface of the optical means is directed.

4,109,258

SHUTTER FOR CAMERAS

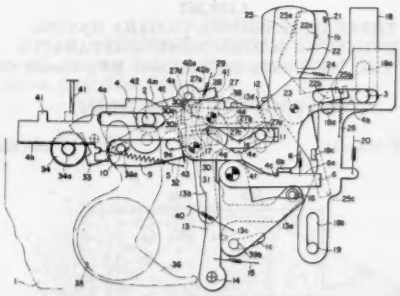
Kunio Arisaka, Urawa, and Hiroyuki Harada, Kawaguchi, both of Japan, assignors to Copal Company Limited

Filed Jan. 18, 1977, Ser. No. 760,425

Claims priority, application Japan, Jan. 20, 1976, 51-5190; Jan. 26, 1976, 51-7466[U]; Jan. 29, 1976, 51-9191[U]

Int. Cl.[2] G03B *7/08, 9/08*

U.S. Cl. 354—38 **9 Claims**



1. A shutter for cameras comprising: shutter blades which are also diaphragm blades; a driving member movable between cocked and uncocked positions and capable of moving at a constant speed upon release of the shutter; an intermediate lever member operatively connected with said driving member and with said shutter blades, said intermediate lever member having a shiftable pivot thereon for determining the operated amount of said shutter blades; a clutch pawl lever member pivoted on said driving member and engaged with said intermediate lever member; and a judging lever member pivoted on said driving member and engageable with said clutch pawl lever member whereby said intermediate lever member is reciprocated to open and close said shutter blades by said clutch pawl lever member being locked by said judging lever member when said driving member is moved from its cocked position to its uncocked position following shutter release, said judging lever member being disengaged from said clutch pawl member so that said intermediate lever member may be held in an immovable state when said driving member is moved from its uncocked position to its cocked position.

4,109,259

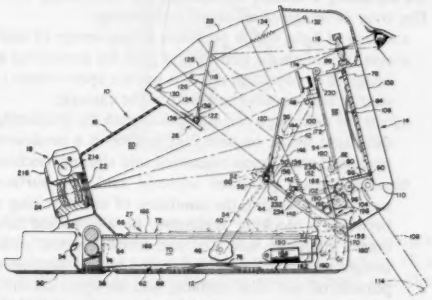
EXPOSURE PREVENTING SHADE

Fred P. Tarr, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 29, 1977, Ser. No. 810,935

Int. Cl.[2] G03B *17/50*

U.S. Cl. 354—86 **4 Claims**



1. A reflex camera comprising:

means for locating a film cassette having an exposure aperture in position for exposure of a film unit contained therein;

means for initiating an exposure cycle;

means for light shielding the film unit during viewing of a subject to be photographed, said light shielding means includes an opaque shade having an exposure aperture therein, said opaque shade being mounted closely adjacent said locating means for movement between a first position wherein it covers and prevents exposure of the film unit and a second position wherein said exposure aperture in said opaque shade is located in alignment with an exposure aperture in the film cassette, said movement into said second position being in response to actuation of said exposure initiating means;

a pair of elongate rollers mounted adjacent said locating means, said rollers being mounted in position to receive the film unit therebetween as it is being advanced from its exposure position within the film cassette, following exposure, and spread a processing fluid across a photosensitive element of the film unit;

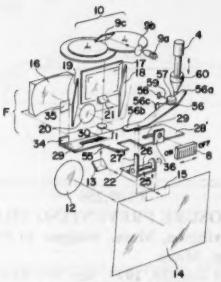
means for driving at least one of said rollers; and

means coupled to said driving means and said light shielding means for moving the shade from said second position to said first position as the exposed film unit is being advanced away from said exposure position by said rollers

4,109,260
SUPERIMPOSING DEVICE FOR USE IN A DATA-RECORDING CAMERA

Susumu Fujita; Yoichi Hamada, both of Kobe, and Makoto Kuboshima, Sagamihara, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Nov. 17, 1977, Ser. No. 852,188
Claims priority, application Japan, Nov. 19, 1976, 51-139668; Nov. 19, 1976, 51-155911[U]
Int. Cl.[2] G03B *13/02, 17/24*
U.S. Cl. 354—106 10 Claims



1. A superimposing device for use in a data-recording camera including a shutter mechanism for interposing data on a film over an image of an object comprising:

a source of light which produces a light image of said data;

means for defining a first optical path for projecting a light image of an object on the film surface upon release of said shutter mechanism employed in the camera;

means for defining a second optical path for projecting said data light image on said film surface at a predetermined portion thereof upon release of said shutter mechanism;

blocking means provided adjacent said film surface and means for changing the condition of said blocking means between a blocking condition, in which said blocking means intercepts said first and second optical path light images to block the light directed to said predetermined portion of said film surface, and an open condition, in which said blocking means is released from blocking said first and second optical paths; and

means for causing said blocking means to change to said blocking condition before the exposure of said light image of the object on said film surface for preventing said predetermined portion of said film which is constituting a background of the data from being exposed by the light image of the object so that the data is clearly formed in said predetermined portion of said film.

4,109,261
CAMERA FOR TAKING THREE DIMENSIONAL PHOTOGRAPHS

Chi Y. Law, 7845 Cambie St., Vancouver, Canada

Filed Feb. 3, 1977, Ser. No. 765,230
Int. Cl.[2] G03B *35/00*
U.S. Cl. 354—112 10 Claims

1. A photographic camera for three dimension photography comprising:

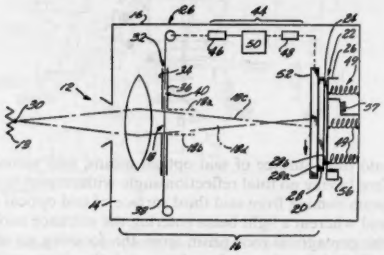
a housing having an opening to the interior for light rays;

means for immovably locating photosensitive material in communication with the interior of the housing at a location during a time for exposure;

optical means in said housing for projecting light rays, which are received through said opening from a scene to be photographed, along an optical path to said location, said path having a first position therealong extending transversely to the direction of the path from a first side to a second side of the path, the optical means comprising

a lenticular screen extending across said path at a second position farther along said path from the first position and having, on one side, a plurality of elongated lenticular elements of width P which face in the direction from which the light rays are being projected and having an opposite side facing and positioned for contact with the surface of such located photosensitive material,

the optical means being characterized in that it changes, by a predetermined distance Y, on such surface of the photosensitive material, the position of light rays which come from a substantially common point on such scene and which extend along said first and second sides of said path;



means for blocking the received light rays at said first position;

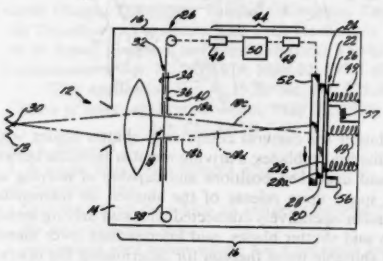
an aperture movable transversely across said path at said first position, from said first side to said second side, for exposing said light rays sequentially to the photosensitive material moving across said screen in a direction normal to the elongation of said lenticular elements; and

means for so moving said aperture for a predetermined time for exposure while simultaneously and synchronously moving said screen, substantially throughout said predetermined time for exposure, in substantially the same direction as the light rays sequentially expose said photosensitive material and over a distance substantially equal to the sum of P + Y to thereby expose a substantially continuous unreversed image of the scene on the photosensitive material.

4,109,262
THREE DIMENSIONAL CAMERA HAVING LENTICULAR SCREEN MOVING APPARATUS

Chi Y. Law, 7845 Cambie St., Vancouver B.C., Canada (V6P 3J1)

Filed Feb. 3, 1977, Ser. No. 765,232
Int. Cl.[2] G03B *35/00*
U.S. Cl. 354—112 25 Claims



1. A photographic camera for three dimension photography comprising:

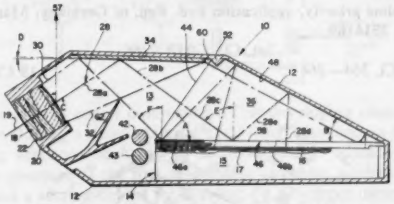
a housing having an opening to the interior for light rays;
means for immovably locating photosensitive material in communication with the interior of the housing at a location during a time for exposure;
optical means in said housing for projecting light rays, which are received through said opening from a scene to be photographed, along an optical path to said location, said path having a first position therealong extending transversely to the direction of the path from a first side to a second side of the path, the optical means comprising
a lenticular screen extending across said path at a second position farther along said path from the first position and having, on one side, a plurality of elongated lenticular elements of width P which face in the direction from which the light rays are being projected and having an opposite side facing and positioned for contact with the surface of such located photosensitive material,
the optical means being characterized in that it changes, by a predetermined distance Y, on such surface of the photosensitive material, the position of light rays which come from a substantially common point on such scene and which extend along said first and second sides of said path;
means for blocking the received light rays at said first position;
an aperture movable transversely across said path at said first position, from said first side to said second side, for exposing said light rays sequentially to the photosensitive material moving across said screen in a direction normal to the elongation of said lenticular elements; and
means for so moving said aperture for a predetermined time for exposure, while simultaneously and synchronously moving said screen, substantially throughout said predetermined time for exposure, in substantially the same direction as the light rays sequentially expose said photosensitive material and over a distance substantially equal to the sum of P + Y to thereby expose a substantially continuous unreversed image of the scene on the photosensitive material;
said means for locating comprising means for applying a substantially uniform pressure, over at least the portion of said photosensitive material for exposure, against said lenticular screen for maintaining uniform contact therebetween;
said means for moving comprising means for moving said screen relative to said photosensitive material, initially prior to the exposure time, to thereby cause any deformations of the photosensitive material to be smoothed out prior to the exposure time.

4,109,263

COMPACT PRISM CAMERA

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1976, Ser. No. 720,004
Int. Cl.[2] G03B *17/17*
U.S. Cl. 354—150 **30 Claims**



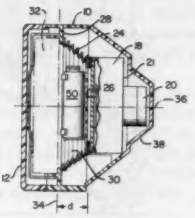
1. A compact camera for producing an image of an object on film having its photosensitive surface coincident with a film plane, said camera comprising:
a housing that encloses an exposure chamber;
lens means mounted on said housing for focusing at said film plane light from within a selected angular field of view; and
prism means located within said exposure chamber for forming a folded optical path between said lens means and said film plane and having a first face in light receiving optical alignment with said lens means, a second face that overlies and is closely spaced from said film plane and forms a first angle with respect to said first face, said second face being in optical alignment with said first face for receiving and redirecting at least partially by total internal reflection light incident along said optical path on said first face, and a third face that forms an acute second angle with respect to said second face, said first angle being greater than said second angle, said third face being in optical alignment with said second face for receiving and reflecting said internally reflected light onto said second face for transmission through said second face to said film plane.

4,109,264

BATTERY MOUNT FOR COLLAPSIBLE CAMERAS

Donato F. Pizzuti, Saugus, and Irving S. Lippert, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1976, Ser. No. 719,840
Int. Cl.[2] G03B *17/04*
U.S. Cl. 354—187 **4 Claims**



1. A photographic camera comprising:
a film housing having front and rear faces and including a displaceable rear cover for facilitating the insertion of a film pack into, and its subsequent removal from, said film housing;
a shutter housing assembly having front and rear faces and containing means including electrical equipment for exposing film, said assembly including a central lens aperture opening through the rear face thereof;
means for supporting said shutter housing assembly for movement between an extended operative position spaced with respect to said film housing and a retracted position located towards said film housing from said operative position; and
a collapsible bellows to establish a light-tight chamber between the rear face of said shutter housing assembly and the front face of said film housing;
said shutter housing assembly including means for supporting an elongated electric battery within said chamber with the battery extending parallel to the film plane of said camera and in fixed relation to, and closely adjacent, said rear face of said shutter housing assembly, the batteries and said battery supporting means being spaced forwardly of but immediately adjacent the camera's film plane when said shutter housing assembly is in its said retracted position so that the batteries are immediately visible and directly accessible at such times as said displaceable cover is opened, said battery supporting means comprising:
a frame secured by a light-tight seal about the periphery thereof to said bellows, said frame defining a rearwardly projecting light baffle about said lens aperture

and a pair of battery nests on opposite sides of said light baffle;

a fixed bus strip positioned beyond said light baffle at one end of and extending between said nests, and a battery terminal at the other end of each of said nests;

fixed battery retaining brackets respectively located adjacent one end of each said nest to retain one end of a battery positioned in each of said nests; and

a releasable clip positioned beyond said light baffle at said other end of each said nest to retain the opposite ends of batteries positioned therein, said releasable clip comprising a one-piece pivotable member having a bar portion supporting a pair of ring-like battery engaging portions at opposite ends thereof.

4,109,265

FOCAL PLANE SHUTTER

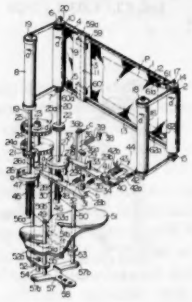
Akihiko Hashimoto, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,822

Claims priority, application Japan, Dec. 25, 1975, 50-155296; Dec. 25, 1975, 50-155297

Int. Cl.[2] G03B 9/28

U.S. Cl. 354—244 **11 Claims**



1. A focal plane shutter comprising:

a first and a second shutter blind;

a first take-up drum and a first winding drum supporting first and second ends of said first blind, respectively;

a second take-up drum and a second winding drum supporting first and second ends of said second blind, respectively;

a first blind winding pinion and a second blind winding pinion mounted on said first blind winding drum and said second blind winding drum, respectively, for integral operation with said first blind winding drum and said second blind winding drum, respectively;

means for driving said first blind winding pinion and said second blind winding pinion in a shutter winding direction responsive to a shutter charging operation;

said drive means comprising a first and a second shutter winding sector shaped gear adapted to rotate into meshing engagement with said first and said second blind winding pinions, respectively, in response to a shutter charging operation, each of said sector-shaped gears having a predetermined orientation prior to the initiation of a shutter charging operation;

each of said first and second sector-shap gears having a gap formed therein, said gap in said first gear and said gap in said second gear formed at a location which is opposite to said first and second winding pinions, respectively, when said first and second gears are in said predetermined positions, whereby said first and second gears are maintained out of meshing engagement with said first and second pinions, respectively, when a shutter charging operation does not take place, said gears being positioned such that said first blind winding pinion precedes said second blind winding pinion in rotation when a shutter charging operation is initiated.

4,109,266

BRAKING MECHANISM FOR FOCAL PLANE SHUTTERS

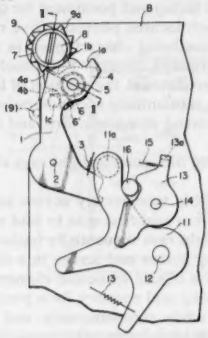
Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Japan

Filed Apr. 18, 1977, Ser. No. 788,657

Claims priority, application Japan, Apr. 19, 1976, 51-49110[U]

Int. Cl.[2] G03B 9/40, 9/08

U.S. Cl. 354—246 **6 Claims**



1. A braking mechanism for focal plane shutters comprising a shutter base plate, a shutter blade actuating member supported rotatably on said base plate to run shutter blades, a brake operating member supported rotatably on said blade actuating member and capable of taking its operating position and its non-operating position, a brake wheel supported rotatably with a friction on said base plate and having thereon a plurality of engaging portions engageable with said brake operating member, and a stopper provided on said base plate to end the operation of said shutter blade actuating member, said brake operating member being engaged with said brake wheel to apply a braking force to said shutter blade actuating member a little before said shutter blade actuating member collides with said stopper.

4,109,267

SHUTTER CONTROL APPARATUS FOR CAMERA DEVICES

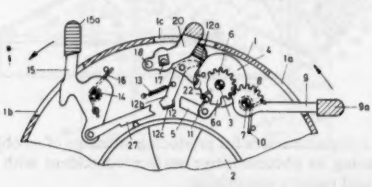
Richard Theurer, Hofen (Enz), Fed. Rep. of Germany, assignor to Prontor-Werk Alfred Gauthier GmbH, Wildbad, Fed. Rep. of Germany

Filed Mar. 25, 1976, Ser. No. 670,322

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514169

Int. Cl.[2] G03B 9/66

U.S. Cl. 354—266 **18 Claims**



11. Operating means for use with a control means to open

and close the blades of a camera shutter mechanism in a housing, which comprises:

a manually actuatable first operating member movable for cocking the camera shutter blade control means and provided with an observable first portion external to the housing,

a manually actuable second operating member movable for releasing the camera shutter blade control means and provided with an observable second portion external to the housing,

a pair of opposed separate axle means upon which the first and second operating members are respectively adapted to rotate for movement for correspondingly cocking and releasing the shutter blade control means,

respective return spring means individually actuatable after the corresponding cocking and releasing movement to return the first and second operating members to their original positions,

observable indicating means movable into one or the other of two indicating states in accordance with the actuation of one or the other of the operating members, and

observable associated coding means concordantly provided between the individual indicating states of the indicating means and the corresponding operating members, including a first coding on the first portion of the first operating member external to the housing and on the indicating means in concordance with one of the indicating states thereof and a second coding on the second portion of the second operating member external to the housing and on the indicating means in concordance with the other of the indicating states thereof, for thereby providing an observable concordant indication of the state of the shutter mechanism.

4,109,268

APPARATUS FOR DEVELOPING A PHOTOSENSITIVE MATERIAL USING A VAPOROUS AMMONIA-CONTAINING DEVELOPER

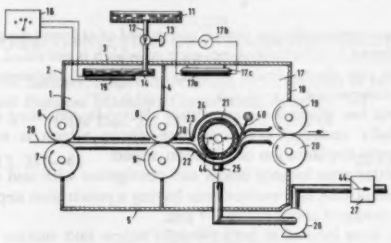
Herbert Schröter, Taunusstein, and Eckehard Stein, Frankfurt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 13, 1977, Ser. No. 787,273

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616812

Int. Cl.[2] G03D *7/00*

U.S. Cl. 354—299 **14 Claims**



1. In a diazo copier comprising a first developing chamber for developing a diazo material employing an ammonia-containing vaporous developer, a second chamber adjacent an output aperture of the first developing chamber, a source of heat and a suction device for drawing off developer escaping from the second developing chamber through an output aperture and for removing developer from the diazo material,

the improvement comprising a rotatably mounted porous hollow roller means forming part of said suction device positioned in said second chamber, suction duct means connected to said roller means, and there being no heat-conducting means between the source of heat and transport means provided for bringing the copying material in contact with the hollow suction roller means.

4,109,269

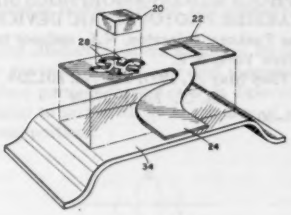
OPTO-COUPLER SEMICONDUCTOR DEVICE

John Alva Hatch, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 27, 1976, Ser. No. 754,339

Int. Cl.[2] H01L *31/12*

U.S. Cl. 357—19 **3 Claims**



1. An opto-coupler semiconductor device comprising in combination:

a support member,

a sensor integrated circuit mounted on said support member,

a conducting tape having an aperture therethrough,

a light emitting diode positioned and mounted on said conducting tape for directing light through said aperture in said conducting tape,

a transparent spacing and mounting tape having an adhesive on both sides thereof extending over said sensor integrated circuit and mounting said light emitting diode on said sensor integrated circuit so that said light emitting diode is aligned with and accurately spaced from said sensor integrated circuit for directing light thereto.

4,109,270

SEMICONDUCTOR STORE

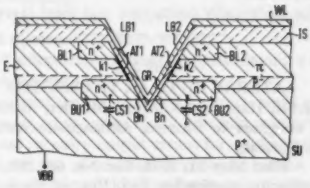
Paul Werner von Basse, Wolfratshausen, and Rüdiger Hofmann, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 22, 1977, Ser. No. 789,953

Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619713

Int. Cl.[2] H01L *29/78*

U.S. Cl. 357—23 **5 Claims**



1. A semiconductor store comprising a semiconductor substrate of a highly doped semiconductor material of one conductivity type, an epitaxial layer on one surface of said substrate of the same conductivity type and of low doping, a buried layer lying partly in said substrate and partly in said epitaxial layer, said buried layer being of the pposite conductivity type and of high doping, a highly doped second layer of the same conductivity type as said buried layer in the outer surface of said epitaxial layer, a V-shaped groove extending through said second layer, said epitaxial layer and through said buried layer and penetrating into said substrate, an insulating

layer covering said epitaxial layer and the walls of said V-shaped groove, a layer of conductive material covering said insulating layer, in each side of said groove there being arranged a selector transistor which consists of a sub-portion of said buried layer, a sub-portion of said second layer and a conductor path portion of said conductor path, and said storage capacitor which is connected to said selector transistors consisting of a blocking layer which is formed by a sub-portion of said buried layer and said semiconductor substrate.

4,109,271

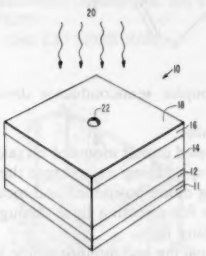
AMORPHOUS SILICON-AMORPHOUS SILICON CARBIDE PHOTOVOLTAIC DEVICE

Jacques Isaac Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1977, Ser. No. 801,239

Int. Cl.[2] H01L *27/14*

U.S. Cl. 357—30 **13 Claims**



1. A photovoltaic semiconductor device comprising:

a first layer of amorphous silicon prepared by a glow discharge in silane and a doping gas, said first layer being of one conductivity type:

a second layer of amorphous silicon prepared by a glow discharge in silane contiguous to said first layer, said second layer being substantially intrinsic;

a third layer of amorphous silicon carbide prepared by a glow discharge in a mixture of silane, a hydrocarbon and doping gases contiguous to said second layer and spaced opposite said first layer, said third layer having an incident surface opposite said second layer on which solar radiation is capable of impinging, said third layer being of a conductivity type opposite that of said first layer and having a bandgap energy in the range of about 2.2 eV to 3.2 eV;

a substrate contiguous to and electrically contacting said first layer; and

means for electrically contacting said third layer.

4,109,272

LATERAL BIPOLAR TRANSISTOR

Heiner Herbst, Haar, and Ruediger Mueller, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,780

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2529951

Int. Cl.[2] H01L *27/12, 29/06, 29/72*

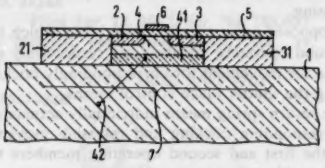
U.S. Cl. 357—35 **8 Claims**

1. A lateral bipolar transistor comprising:

(a) a silicon film epitaxially deposited on an electrical insulating substrate;

(b) a portion of said silicon film forming a base zone of first conductivity type therein, said base zone portion of the silicon film having at a surface thereof a laterally extending emitter zone of depth less than the base zone and of second conductivity type and a laterally extending collector zone of depth less than the base zone and of second conductivity type providing increased emitter and collector junction surfaces with respect to said base;

(c) a highly doped zone of first conductivity type having a higher impurity concentration than said base zone arranged below and in contact with said base zone and below said laterally extending emitter and collector zones at a boundary between said silicon film and the electrical



insulating substrate for reducing minority carrier recombination at the insulating substrate; and

(d) an emitter terminal zone connected to the emitter zone and a collector terminal zone connected to the collector zone, said terminal zones having the same conductivity type as said emitter and collector zones and having a depth at least as great as the base zone.

4,109,273

CONTACT ELECTRODE FOR SEMICONDUCTOR COMPONENT

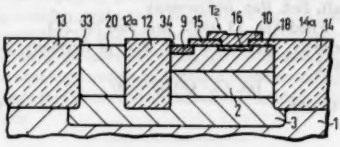
Andreas Glasl, Haar, and Helmuth Murrmann, Ottobrunn, both Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 603,938, Aug. 12, 1975, abandoned. This application Jun. 29, 1977, Ser. No. 811,267

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1974, 2439408

Int. Cl.[2] H01L *29/72, 27/02, 27/12*

U.S. Cl. 357—35 **1 Claim**



1. In a semiconductor device comprised of at least two zones of different conductivity type, each of which is provided with at least one electrode for an integrated circuit, the improvement comprising:

wherein one electrode is an emitter electrode consisting of an initially undoped polycrystalline silicon which is subsequently implantation or diffusion doped;

an emitter zone located below and contiguous with said emitter electrode, said emitter zone having a penetration depth in the range of about 0.2 to 0.7 μm;

a base zone located at least partially below said emitter zone and spaced from said emitter electrode, said base zone having a penetration depth in the range of about 0.2 to 0.7 μm;

a collector zone located below and contiguous with said emitter zone;

a buried layer located at least partially below and partially contiguous with said collector zone;

a pair of spaced-apart oxide layers having face surfaces located perpendicularly to the plane containing said emitter electrode, said spaced-apart oxide layers abutting to side surfaces of said base zone and side surfaces of said collector zones, at least one of said spaced-apart oxide layers abutting to a side surface of said emitter zone; and

a relatively highly conductive zone located between said emit-

ter electrode and one of said spaced-apart oxide layers and in contact with said buried layer.

4,109,274

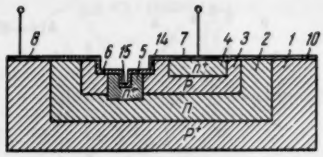
SEMICONDUCTOR SWITCHING DEVICE WITH BREAKDOWN DIODE FORMED IN THE BOTTOM OF A RECESS

Nikolai Mikhailovich Belenkov, Teply stan, mikroraion 6, korpus 93, kv. 236; Anatoly Ivanovich Kurnosov, prospekt Mira, 190a, kv. 20, and Evgeny Efremovich Malitsky, ulitsa Begovaya, 15, kv. 9, all of Moscow, U.S.S.R.

Filed Jan. 8, 1976, Ser. No. 647,360

Int. Cl.[2] H01L *29/74, 29/06*

U.S. Cl. 357—38 **4 Claims**



1. A semiconductor switching device which has a semiconductor crystal comprising: a first base region of a certain conductivity type; a second base region of a conductivity type opposite to said first base region that is disposed in said first base region and extends mainly on one of the basic surfaces of the crystal; a first additional region of the same conductivity type as said first base region disposed in the second region, extending on the same surface; a second additional region of the same conductivity type as said first base region, disposed in the second region at the bottom of a first recess provided in said main surface of the crystal so that it has no contact with lateral walls of the recess, at least a part of said second additional region being disposed in said first base region, adjacent to said second base region, the concentration of the impurity on the surface of said second additional region being higher than that of said first base region, said second additional region and said first base region being of one conductivity type, and a second recess being provided within the bottom of said first recess in the additional region, the lateral walls of said second recess having no contact with the boundaries of said second additional region.

4,109,275

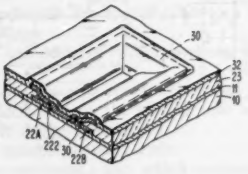
INTERCONNECTION OF INTEGRATED CIRCUIT METALLIZATION

Homi G. Sarkary, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,240

Int. Cl.[2] H01L *23/48, 29/44, 29/52*

U.S. Cl. 357—68 **20 Claims**



1. In a semiconductor integrated circuit array comprising a semiconductor substrate, a dielectric layer on said substrate, a plurality of semiconductor devices integrated in said substrate, and an electrical conductor pattern on said layer electrically connected to at least one of said devices, the improvement comprising

(A) at least one selected discrete region of said pattern comprising a plurality of spaced portions for electrical connection to each other wherein said portions coextend over and on an imperforate portion of said layer,

(B) a dielectric coating over said conductor pattern and said layer,

(C) a via opening through said coating extending to and terminating short of said layer, with said via opening in register with the gaps between said portions exposing adjacent segments thereof intermediate and spaced from the outermost lateral edges of said conductor portions, and

(D) a second conductor pattern extending through said via holes in electrical contact with said segments, including top surface portions thereof, and in dielectric insulated relationship to said substrate in the area of said gap between said portions.

4,109,276

MEMORY READ/WRITE ORGANIZATION FOR A TELEVISION SIGNAL PROCESSOR

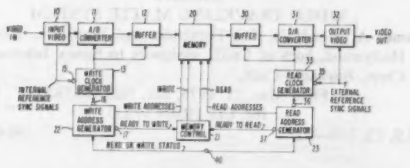
Robert Sherman Hopkins, Jr., Marlton; Arthur James Banks, Cherry Hill, and Robert Adams Dischert, Burlington, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,949

Claims priority, application United Kingdom, Mar. 19, 1976, 11113/76

Int. Cl.[2] H04N *5/78, 9/46*

U.S. Cl. 358—4 **3 Claims**



1. Television signal synchronizer apparatus for providing field conversions between an input video signal and an output video signal, said input and output video signals being non-synchronous, comprising:

input and output video processing means adapted to be coupled to memory storage means;

a source of independent reference signals having a non-variant field sequence;

memory control means including memory input means for writing said input video signal into said memory storage means and memory output means for reading said output video signal out of said memory storage means;

means for developing field identification signals from one of said input video signal or said independent reference signal;

means for developing a source of field conversion signals from said field identification signals and said non-variant field sequence signal, and

delay means coupled to said memory input and said memory output means responsive to said source of field conversion signals and said field identification signals for modifying the writing and reading of data in and out of said memory storage means so as to provide field conversions consistent with said non-variant field sequence.

4,109,277

APPARATUS FOR READING A RECORD CARRIER

Eric Christian Schylander, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 653,082, Jan. 28, 1976, abandoned. This application Jan. 13, 1977, Ser. No. 759,059
Claims priority, application Netherlands, Oct. 17, 1975, 7512186
Int. Cl.[2] H04N *5/78*
U.S. Cl. 358—8 10 Claims

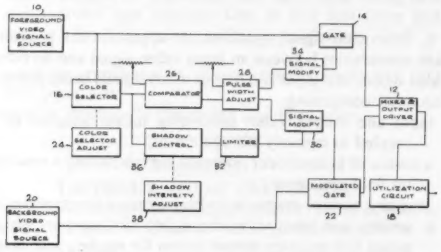
1. An apparatus for reading a record carrier on which a television signal is recorded, said signal comprises horizontal synchronizing pulses and burst signals which are coupled to these horizontal synchronizing pulses, said burst signals consisting of a number of periods of a carrier wave with a frequency which is an integral multiple of half the line frequency, said read apparatus comprising a time error correction device for correcting time errors in the read-out television signals, a time error detector means for detecting said time errors and for supplying a corresponding control signal to the time error correction device, said time error detector means comprising a keying signal generator means triggered by the horizontal synchronizing pulses for supplying a keying signal having a predetermined phase relationship with said horizontal synchronizing pulse, said phase relationship being such that the beginning of the keying signal each time lies within the time interval occupied by the burst signal, a zero passage detector means for detecting the first zero passage of the burst signal which appears after the beginning of said keying signal, a measuring circuit means for measuring the time interval between the beginning of this keying signal and the next zero passage of the burst signal which is detected and for supplying a corresponding correction signal, said keying signal generator means further comprising means for adjusting the phase of the keying signal relative to the horizontal synchronizing pulse depending on the correction signal.

4,109,278

VIDEO TRAVELING MATTE SYSTEM

James A. Mendrala, San Fernando, and Harold L. Peterson, Hollywood, both of Calif., assignors to Sonex International Corp., Burbank, Calif.

Filed Mar. 21, 1975, Ser. No. 560,583
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—22 34 Claims



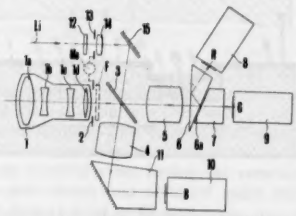
1. In an arrangement in which the video signal from a first source is processed and thereafter compared with a reference in comparator means to generate generally squarewave pulses, the pulses controlling the relative gating of the video signal from the first source and a video signal from a second source to an output, the improvement comprising means for increasing the width of each pulse generated by the comparator means by a selected amount to prevent formation of a matte outline in a composite image generated by the video signals from the first and second sources, and means associated with the means for increasing the width of the pulse controlling the width increase to a selected amount sufficient to expand an image created from one of said signals into a region normally occupied by the matte outline.

4,109,279

TELEVISION CAMERA OPTICS WITH A LIGHT GUIDE FOR CAMERA ADJUSTMENT

Ryusho Hirose, Machida, and Kotaro Wakui, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha and Nippon Hoso Kyokai, both of Tokyo, Japan

Continuation of Ser. No. 689,912, May 25, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,207
Claims priority, application Japan, May 28, 1975, 50/63891
Int. Cl.[2] H04N *9/09*; G02B *27/14*
U.S. Cl. 358—55 9 Claims



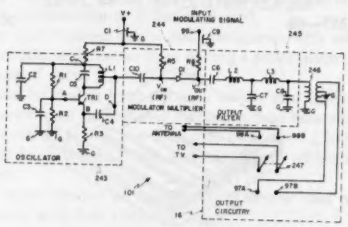
1. A television camera optical system for viewing a scene and having a light guide for camera adjustment comprising:
(a) a television lens group including a front lens group,
(b) a plurality of photo-detecting means,
(c) a color separation means positioned substantially between said front lens group and said photo-detecting means,
(d) a primary shading means positioned on the object side of said color separation means and receiving light from the scene through said front lens group.
(e) a light guiding path outside said television lens group for transmitting light from the scene and in which a transparent means and an adjustable secondary shading means are positioned, and
(f) a beam splitting means positioned on the image side of said primary shading means at a location substantially coincident with a point of intersection of the optical axis of said light guiding path and said television lens group.

4,109,280

TELEVISION INTERFACE DEVICE

Glen R. Dash, Watertown, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 28, 1976, Ser. No. 700,647
Int. Cl.[2] H04N *7/10, 5/44*; H04B *1/06*
U.S. Cl. 358—86 9 Claims



9. An interface device for use in connection with a television receiver and operable to connect a local RF signal to the receiver, that comprises, in combination: oscillator means to produce said local RF signal; and diode multiplier means comprising a diode connected to receive at its output or cathode an

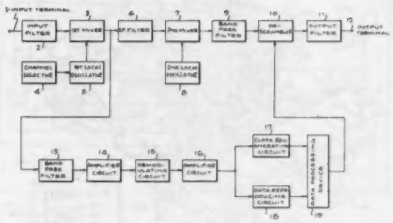
input sync pulse and video modulation that form a composite video signal that serves as a modulating signal and to receive at its input or anode the local RF signal and being operable to multiply the two to effect modulation of the RF signal by said modulating signal, said diode multiplier means further including a resistor connected between the input of the modulating signal and said output or cathode.

4,109,281

TERMINAL DEVICE FOR CATV

Tetsuo Kanazashi, and Tsuyoshi Fujiwara, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,592
Claims priority, application Japan, May 7, 1976, 51-51964
Int. Cl.[2] H04N *1/44*
U.S. Cl. 358—114 **4 Claims**



2. In a CATV system transmitting within a selected bandwidth a plurality of video channels of different frequencies and also a data signal at a selected adjacent frequency downstream to individual subscriber's terminals, the combination comprising:

frequency converter means controllable by a subscriber for converting the selected bandwidth to a selected frequency range in which a chosen video channel is at a predetermined frequency;

video signal processing means responsive to the predetermined frequency for providing the desired video program;

data signal extracting means coupled to derive the fundamental, unconverted, data signal frequency from the output of the frequency converter means; and

means responsive to the unconverted data signal frequency for deriving digital data therefrom.

4,109,282

APPARATUS AND METHOD FOR PRINTING INFORMATION ONTO A SURFACE

Penrose David Robertson, and George Franklin Coulouris, both of London, England, assignors to National Research Development Corporation, London, United Kingdom

Filed Jan. 28, 1977, Ser. No. 763,491
Claims priority, application United Kingdom, Feb. 5, 1976, 4638/76
Int. Cl.[2] H04N *5/76;* G01D *15/16;* H04N *1/24*
U.S. Cl. 358—127 **12 Claims**

1. Printing apparatus for applying ink to a surface to be printed, comprising

(a) first and second reservoirs containing different inks, respectively;

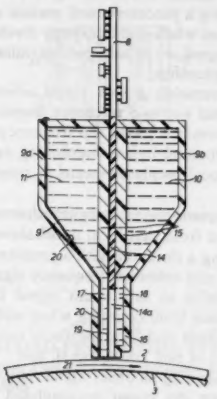
(b) writing head means connected with said reservoirs for writing information on the surface with said inks, said writing head means including

(1) a body member defining a nib;

(2) said nib containing a duct which terminates at one end in an orifice adjacent the surface; and

(3) a flap valve arranged in said duct for defining first and second ink flow passageways the other ends of which are connected with said first and second reservoirs, respectively;

(c) means for producing relative movement between the writing head and the surface in a direction causing ink to be supplied in a line from said passageways; and



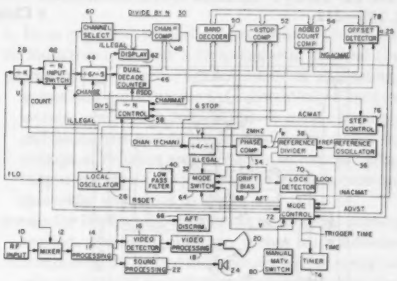
(d) control means for displacing said flap to selectively obturate said passageways, respectively, whereby information may be written selectively in said line as a function of the degree of mixing of said different inks.

4,109,283

FREQUENCY COUNTER FOR A TELEVISION TUNING SYSTEM

Robert Morgan Rast, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,588
Int. Cl.[2] H04N *5/44, 5/50;* H04B *1/16, 1/32*
U.S. Cl. 358—191 **13 Claims**



1. In a system for tuning a television receiver to the various channels a viewer may select, apparatus comprising:

local oscillator means for generating a local oscillator signal;

counter means for generating a frequency divided signal by counting a predetermined number of periods of said local oscillator signal, said predetermined number being proportional to the frequency of said local oscillator signal;

means for generating a reference frequency signal;

phase control means for generating a control signal representing the phase and frequency deviation between said frequency divided signal and said reference frequency signal;

mode switching means for selectively coupling said control signal to said local oscillator means; said mode switching means initially coupling said control signal to said local oscillator means;

said local oscillator means changing the frequency of said local oscillator signal in response to said control signal until said frequency divided signal and said reference

frequency signal to be in a predetermined phase and frequency relation;

said counter means accumulating a nominal number of counts during a predetermined portion of said frequency divided signal when said frequency divided signal and said reference signal are in said predetermined phase and frequency relationship;

means for generating a lock signal when said frequency divided signal and said reference frequency signal are in said predetermined phase and frequency relationship;

said mode switching means decoupling said control signal from said local oscillator means in response to said lock signal;

means for generating a count signal when said control signal is decoupled from said local oscillator means, said count signal having a duration with a predetermined time relationship to said reference frequency signal;

means responsive to said count signal for disabling said counter means from counting when said control signal is decoupled from said local oscillator means except during the duration of said count signal; and

means for generating an offset signal representing the deviation between the count accumulated by said counter means during a time interval corresponding to said predetermined portion of said frequency divided signal when said control signal is decoupled from said local oscillator means and said nominal number of counts, said offset signal being coupled to said mode switching means to control the coupling of said control signal to said local oscillator means.

4,109,284

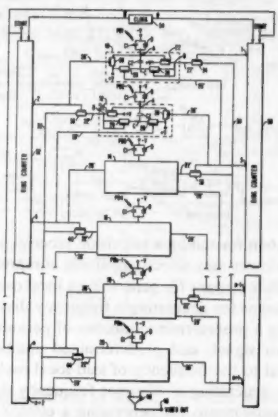
SELF-SCANNING PHOTO-SENSITIVE CIRCUITS

James Darrell Tompkins, Essex, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 641,193, Dec. 15, 1975, Pat. No. 4,023,048. This application Nov. 15, 1976, Ser. No. 741,656

Int. Cl.[2] **H04N** *3/12;* **H01J** *39/12;* **H03K** *3/353*

U.S. Cl. 358—212 **6 Claims**



1. Self-scanning photo-sensitive circuits comprising

an array of light sensitive devices capable of producing charge variations,

a charge amplification circuit coupled to each of the devices of the array, said amplification circuit including a source follower having a control electrode connected to one of said light sensitive devices, said source follower including a first field effect transistor having a threshold voltage loss and said amplification circuit including means for compensating for the effects of said threshold voltage loss,

a common output line coupled to each of said amplification circuits, and

means for applying pulses to each of said amplification circuits to produce video signals from said light sensitive devices sequentially onto said common output line.

4,109,285

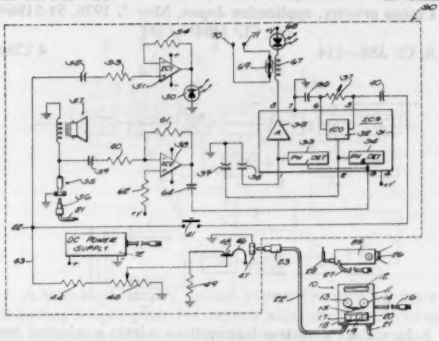
TAPE MACHINE AND SLIDE PROJECTOR SYNCHRONIZING DEVICE

Elso Jose Figueira Legey, 1501 Mower Ct., Wauwatosa, Wis. 53213

Filed Mar. 14, 1977, Ser. No. 777,385

Int. Cl.[2] **G11B** *27/22*

U.S. Cl. 360—80 **13 Claims**



1. Apparatus for use with an intermittently operable picture projector and an audio tape machine to record picture change signals on a tape and to operate the projector in response to occurrence of said signals during playback of the tape, said apparatus comprising:

output circuit means to which an input of a tape recorder may be coupled to enable recording change signals on a tape, said output circuit means including a manually operable switch,

input circuit means to which an output of said tape recorder may be coupled to enable receiving said change signals along with audio signals recorded on said tape,

a decoder device comprising a voltage controlled oscillator having output means coupled to said output circuit means, said oscillator being for producing pulse change signals at a predetermined frequency, said device also having input means coupled with said input circuit means for receiving said change signal pulses, and phase sensitive means coupled therewith, and operative to compare the phase relationship of signals from said voltage controlled oscillator and said change signals from said tape, and semiconductor switch means which change state in response to said phase sensitive means sensing that said signals from said oscillator and said change signals are substantially in phase, and

means responsive to a change of state by said semiconductor switch means by controlling said projector to change a picture.

4,109,286

CASSETTE TAPE RECORDER WITH CASSETTE EJECT MECHANISM

Hiromasa Katsurayama, and Nobuhiro Hirabayashi, both of Nagoya, Japan, assignors to Shin-Shirasuna Electric Corp., Nagoya, Japan

Filed Apr. 21, 1977, Ser. No. 789,513

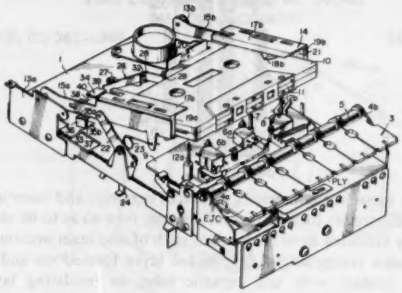
Claims priority, application Japan, Apr. 30, 1976, 51-50410; Aug. 10, 1976, 51-95060; Aug. 10, 1976, 51-95061

Int. Cl.[2] **G11B** *23/04, 15/10, 15/24*

U.S. Cl. 360—96 **6 Claims**

1. A cassette tape recorder including cassette receiving

means having an opening through which a cassette may be inserted or removed, said cassette receiving means being pivotable so as to selectively assume a position in which it is inclined with respect to the chassis of the tape recorder to permit insertion or removal of the cassette and a position in which it is parallel to said chassis to permit a magnetic tape within the cassette fully inserted in said cassette receiving means to be engaged by magnetic head means, characterized by a cassette eject mechanism comprising cassette force-out means mounted on said cassette receiving means at the opposite side thereof from said opening, said cassette force-out means being pivotable between a first position in which one end thereof is extended into said cassette receiving means so as to be engageable by the back wall of the cassette inserted in said cassette receiving means and a second position in which said one end is substantially repelled from said cassette receiving means upon



said cassette being fully inserted in said cassette receiving means, said cassette force-out means being spring-biased toward said first position, and lock means mounted on said cassette receiving means for acting to lock said cassette force-out means in said second position when said cassette force-out means is pivoted to said second position against said spring bias upon the cassette being fully inserted in said cassette receiving means when in said inclined position and to unlock said cassette force-out means when said cassette receiving means with the cassette fully inserted therein is pivoted from said inclined position to said parallel position, said cassette force-out means being adapted to be resiliently pivoted from said second position to said first position by the action of said spring bias to cause said one end to force the cassette from said cassette receiving means when said cassette receiving means with the cassette fully inserted therein is pivoted from said parallel position to said inclined position.

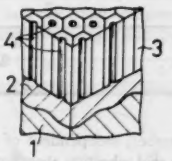
4,109,287

PROCESS FOR RECORDING INFORMATION OR SOUND AND PROCESS FOR PREPARATION OF RECORDING MATERIALS USED THEREFOR

Satoshi Kawai, Chigasaki; Hajime Sato, Hiratsuka, and Toshimatsu Sakai, Odawara, all of Japan, assignors to Pilot Man-Nun-Hitsu Kabushiki Kaisha, Tokyo

Continuation-in-part of Ser. No. 326,102, Jan. 23, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 543,006
Claims priority, application Japan, Apr. 14, 1972, 47-37421
Int. Cl.[2] G11B *5/74;* **C25D** *5/00, 11/00;* **C09D** *5/23*
U.S. Cl. 360—131 **2 Claims**

1. A method for recording information or sound which comprises providing a magnetic recording element having a regular orientation and comprising aluminum or an aluminum alloy containing a predominant proportion of aluminum having on the surface thereof an anodic oxide film of numerous micro pores regularly arranged with a cener-to-center distance between adjacent micro pores within the range of 400-2000A, each of the micro pores being substantially completely filled by electrolytical deposition with a metal or alloy derived from at least one member selected from the group consisting of cobalt salts, nickel salts, chromium salts and iron salts, and magnetizing the magnetic recording element with magnetic flux generated from a magnetic head.

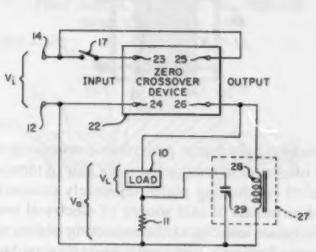


4,109,288

OVERLOAD PROTECTION SYSTEM

Sidney G. Berenson, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 9, 1976, Ser. No. 748,991
Int. Cl.[2] H02H *9/00*
U.S. Cl. 361—58 **2 Claims**



1. In an overload protection system for a circuit having an inductive load with a ferromagnetic material core:

means for initiating the application of an alternating voltage across said inductive load at substantially a zero crossover instant, comprising zero crossover means having an input and an output and being adapted to receive a sinusoidal voltage at its input and provide a sinusoidal voltage at its output at a time corresponding to the zero crossing of said sinusoidal voltage at its input; and

means for limiting the magnitude of an initial portion of said applied alternating voltage across said inductive load, comprising an impedance connected in series with said inductive load, switch means shunting said impedance, and means responsive to the sinusoidal voltage at the output of said zero crossover means for closing said switch means a selected time after receipt of the sinusoidal voltage at the output.

4,109,289

CORONA DISCHARGER

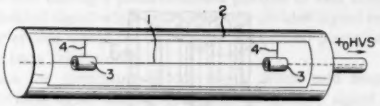
Tsukasa Kuge, and Koichi Tanigawa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1976, Ser. No. 709,078
Claims priority, application Japan, Aug. 4, 1975, 50-94905
Int. Cl.[2] H01T *19/00*
U.S. Cl. 361—230 **8 Claims**

1. In a corona discharger having a corona discharge wire to which a voltage is applied to induce discharge, the improvement comprising:

a member for absorbing vibration of the discharge wire, said

member being disposed to make contact with the discharge wire at least during vibration thereof; and



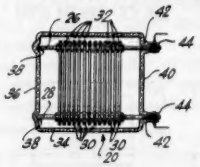
a supporting member, independent of said discharge wire, for supporting said vibration absorbing member for movement in response to vibration of the discharge wire.

4,109,290

MEANS FOR GENERATING A NEGATIVE CHARGE

James C. Gallagher, San Diego, Calif., assignor to APSEE, Incorporated, San Diego, Calif.

Filed Apr. 18, 1977, Ser. No. 788,118
Int. Cl.[2] H01J 3/04
U.S. Cl. 361—231 **8 Claims**



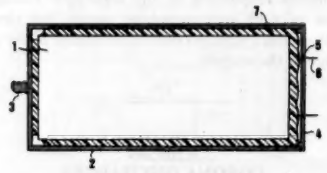
1. An electrical discharge generator comprising:
a source of electrical energy having a pair of terminals, a pair of spaced conducting plates separately connected to said pair of terminals of said source of electrical energy;
dielectric means coating said conducting plates, said dielectric means having a high coefficient of secondary election emission;
chamber means enclosing said conducting plates;
and a gas within said chamber.

4,109,291

IMPREGNATED CONDENSER CONSTRUCTION FOR ELECTRIC POWER TRANSMISSION

Charles Bozzini, Charleroi, Belgium, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Mar. 17, 1977, Ser. No. 778,622
Claims priority, application Belgium, Mar. 17, 1976, 17264
Int. Cl.[2] H01G 1/02
U.S. Cl. 361—272 **4 Claims**



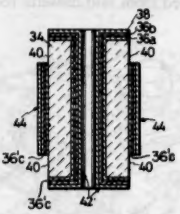
1. A condenser comprising:
a closed tank;
a predetermined number of insulating casings fitting into said tank there being voids between the insulating casings and between the casings and the inner wall of the tank;
individual condenser windings, each of said windings closely fitting into one of said casings, said windings being treated with an insulating liquid, and
wherein the total volume of the voids between said insulating casings in said tank is greater than the total volume of said insulating liquid of said windings whereby emission of gas from the condensers may be absorbed in the voids.

4,109,292

CERAMIC CAPACITOR WITH NICKEL-SOLDER ELECTRODES

Masayoshi Shibayama, Haruna; Yuji Nakano, Komochi, and Youji Shimizu, Haruna, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo

Filed Aug. 4, 1976, Ser. No. 711,445
Claims priority, application Japan, Aug. 8, 1975, 50-95930
Int. Cl.[2] H01G 1/005, 4/06
U.S. Cl. 361—321 **6 Claims**



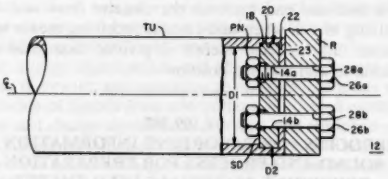
1. A capacitor comprising a tube of ceramic, and inner and outer electrodes formed on said ceramic tube so as to be electrically insulated from each other, each of said inner and outer electrodes comprising a first nickel layer formed on and in direct contact with said ceramic tube, an insulating layer formed on said first nickel layer, an unfired second nickel layer overlying said insulating layer, and a plated solder layer overlying said second nickel layer.

4,109,293

TUBULAR CONDUCTOR FOR METAL CLAD SWITCHGEAR

Norman Davies, Levelgreen, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 15, 1977, Ser. No. 768,938
Int. Cl.[2] H02B 1/04
U.S. Cl. 361—341 **7 Claims**



1. Metal clad switchgear, comprising:
a. metal cabinet means;
b. bus bar riser means disposed within said cabinet means and adapted to be interconnected with an external circuit;
c. load line means disposed within said cabinet means and adapted to be interconnected with a load;
d. a hollow cylindrical electrical conductor, said hollow conductor having a transverse annular groove in the inner surface thereof proximate one end thereof;
e. flange means disposed in said annular groove;
f. first securing means disposed in said flange means, said bus bar riser having an opening therein, one surface of said bus bar riser being disposed flush agaqinst said end of said hollow conductor transverse to the centerline thereof, said opening aligning with said first securing means of said flange means;
g. second securing means, said second securing means

having a portion which protrudes through said opening in said bus bar riser to cooperate with said first securing means in said flange means to hold said bus bar riser against said end of said hollow conductor in a state of compression; and

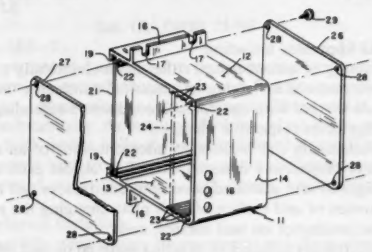
h. circuit control means disposed within said cabinet means in disconnectable disposition with said load line means, said circuit control means having a circular disconnecting terminal which is disposed in disconnectable connection with the other end of said hollow cylindrical conductor.

4,109,294

MOUNTING ENCLOSURE FOR KEY TELEPHONE UNIT CIRCUIT SECTIONS

John Richard Mason, Thousand Oaks, and Arthur L. Foreman, Newhall, both of Calif., assignors to Dracon Industries, Chatsworth, Calif.

Filed Dec. 30, 1976, Ser. No. 755,542
Int. Cl.[2] H02B *1/00*
U.S. Cl. 361—399 **14 Claims**



10. A mounting enclosure for a high power dissipation electrical circuit, comprising:

a U-shaped body extrusion having a top, bottom and front wall, said body extrusion including outwardly extending mounting flanges on said top and bottom walls, rear facing cover grooves in said top and bottom walls, opposed facing interior circuit board retaining grooves in said top and bottom walls, and spaced fastener channels on the interior of said U-shaped extrusion,

a rear cover extrusion having a length substantially the same as said enclosure width and a height equal to the height of said front wall, means for mating said facing rear cover grooves with each side of said rear cover extrusion, whereby said rear cover is retained in said rear cover grooves, said rear cover extrusion having additional fastener channels extending parallel to said means for mating,

a first side cover, said first side cover operating as a heat sink, means for mounting high power dissipation circuit components on said first side cover,

a second side cover,

said first and second side covers each having a pattern of holes therein aligned with said spaced and additional fastener channels,

and a plurality of fastening screws formed to pass through said holes and engaging the walls of said spaced and additional fastener channels, thereby securing said first and second side covers in position.

4,109,295

SOLDERLESS CIRCUIT BOARD COMPONENT

Paul M. Rostek, San Diego, and John F. Baeyertz, Escondido, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1977, Ser. No. 820,654
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—401 **5 Claims**

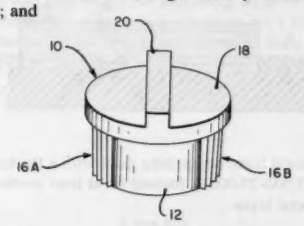
1. A circuit board component comprising:

a cylindrical body element;

an electrical component mounted within said cylindrical body element;

electrically conductive material positioned on portions of the outer surfaces of said body element;

leads connecting said electrical component to said electrical conductive material through said cylindrical body element; and



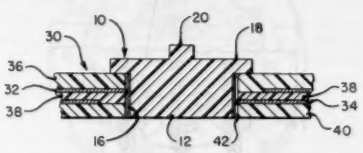
serrations in the electrically conductive material for engaging a contact area on a circuit board.

4,109,296

MACHINE INSERTABLE CIRCUIT BOARD ELECTRONIC COMPONENT

Paul M. Rostek, San Diego, and John F. Baeyertz, Escondido, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1977, Ser. No. 820,655
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—401 **7 Claims**



1. A circuit board component particularly adaptable to being mounted in a circular opening through a multi-layered circuit board comprising:

a cylindrical element having a diameter corresponding to the diameter of the circular opening through the multi-layered circuit board so as to affect a snug fit between said component and the multi-layered circuit board;

at least two recessed sectors in the outer surface of said cylindrical element; and

electrically conductive material positioned in said recessed sectors, said recessed sectors and said electrically conductive material being of a depth and thickness, respectively, which will facilitate the flow of an electrically conductive bonding material between said electrically conductive material and the layers of the multi-layered circuit board which are directly opposed from a respective recessed sector.

4,109,297

CONDUCTION SYSTEM FOR THIN FILM AND HYBRID INTEGRATED CIRCUITS

Nathan George Lesh, deceased, late of Bethlehem, Pa.; by Merchants National Bank of Allentown, executor, Lehigh County, Pa.; Joseph Michael Morabito, Bethlehem, Pa., and John Henry Thomas, III, Pickerington, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 576,711, May 12, 1975, Pat. No. 4,016,050.
This application Mar. 25, 1977, Ser. No. 781,294
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—402 **9 Claims**

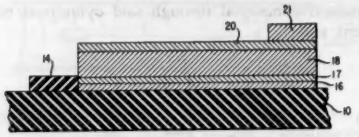
1. A circuit including thin film elements and electrical interconnections of a desired resistivity on the major surface of an insulating substrate, said interconnections comprising:

a first metal layer comprising titanium with a thickness in the range 1,500–3,000 A formed on said substrate;

a second metal layer comprising copper with a thickness in

the range 25,000–40,000 A formed over said first metal layer;

a third metal layer comprising nickel with a thickness in the range 8,000–20,000 A formed on said second layer; and



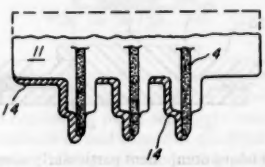
a fourth metal layer comprising gold with a thickness in the range 15,000–25,000 A formed on at least portions of said third metal layer.

4,109,298

CONNECTOR WITH PRINTED WIRING BOARD STRUCTURE

Stephen L. Hanni, Richardson, and Dudley B. Johnson, Irving, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 26, 1976, Ser. No. 708,502
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—412 **10 Claims**



1. A printed wiring board connector, comprising:

(a) a first sheet metal substrate including at least two finger-like projections extending outwardly from the central portion of said first substrate;

(b) a first layer of insulating material covering said first substrate including said finger-like projections and the peripheral edge of said sheet metal substrate, said insulating material further extending outwardly of said first substrate in the area between said at least two finger-like projections;

(c) a first layer of conductive material affixed to selected areas of said first layer of insulating material and said at least two finger-like projections;

(d) a second layer of conductive material affixed to said first layer of insulating material at the peripheral edge of said first sheet metal substrate, including the peripheral edge of the insulating material extending outwardly of the first substrate;

(e) notch means for severing said second layer of conductive material between said at least two finger-like projections, said notch means confronting the insulating material extending outwardly of the first substrate;

(f) a second substrate having at lest two apertures for receiving said at least two finger-like projections;

(g) a second layer of insulating material covering, at least in part, said second substrate; and

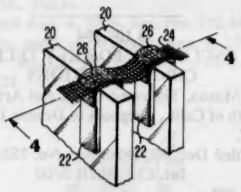
(h) a third layer of conductive material affixed to said second layer of insulating material covering at least part of the peripheral area of said apertures, for making electrical contact with said first layer of conductive material when said finger-like projections, are inserted into said apertures.

4,109,299

ELECTRICAL CONNECTION BETWEEN CONDUCTORS ON SPACED PLATES

Louis Salvatore Cosentino, Belle Mead; John Guiry Endriz, Plainsboro, and George Fairbank Stockdale, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,803
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—412 **4 Claims**



1. An apparatus including

a plurality of spaced plates, either of an electrically conductive material or having an electrical conductor on a surface thereof with each of said conductors extending to an edge of its respective plate,

a substantially flat perforated interconnector of an electrically conductive material extending across each of said edges of said plates adjacent said conductors and along a portion of said surface of each plate engaging the plate or the conductor on said surface, and

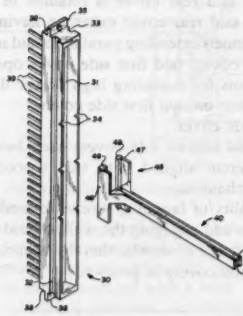
an electrically conductive bonding material on said interconnector at each of said plates, said bonding material extending through the openings in the interconnection so as to secure the interconnection to the plates and electrically connect said interconnector to the conductor on each of said plates.

4,109,300

CIRCUIT CARD CONNECTOR AND SUPPORT DEVICE

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sep. 16, 1977, Ser. No. 833,639
Int. Cl.[2] H02B *1/02*
U.S. Cl. 361—415 **8 Claims**



1. A circuit card connector and support device adapted to mount within a printed circuit card cage comprising:

a connector with a plurality of surfaces, including a first surface with receiving means extending in a longitudinal direction and adapted to provide electrical connection to a first edge of at least one circuit card and second and third surfaces each in direct opposition to each other and each perpendicular to said first surface, said second and

third surfaces each further including a longitudinally oriented channel;

a support device with a plurality of surfaces, including a first surface with a longitudinally oriented channel so disposed as to receive the second edge of said circuit card therein and second and third surfaces each in direct opposition to each other and each perpendicular to said first surface, said second and third surfaces each including guide means arranged to mutually engage said channels on said connector slidably positionable along said channels, said first surface of said support device positioned perpendicular to said first surface of said connector.

4,109,301

ADAPTOR FOR PHOTOGRAPHIC FLASH DEVICE

Yutaka Wakimura, Osaka, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed Nov. 10, 1976, Ser. No. 740,673

Claims priority, application Japan, Nov. 14, 1975, 50-155405[U]

Int. Cl.² G03B *15/02*

U.S. Cl. 362—7 **12 Claims**

1. A removable adaptor for exchangeably juxtaposing a supplementary optical panel, such as a light-converging, — diffusing, — attenuating or color-balancing filter panel in front of the substantially rectangular flashing plane of a photographic flash device body that has peripheral sidewall means which recede back from said flashing plane and include at least two opposed surfaces having first detent means provided thereon,

said adaptor including:

substantially rectangular frame means including structure for receiving said panel therein;

rearwardly projecting mounting flange means having at least two opposed surfaces having second detent means provided thereon which are complementary with the first detent means and so arranged that when the mounting flange means is moved sufficiently axially towards the photographic flash device, the flange means becomes at least partially radially coincident with the peripheral sidewall means of the photographic flash device and the respective first and second detent means become engaged for removably mounting the adapter upon the photographic flash device; and

a forwardly expanding, frusto-pyramidal hood extending between and connecting together the mounting flange means and the frame means.

4,109,302

FLIP FLASH HAVING AUTOMATIC INDICATOR CONTROL

Richard R. Wareham, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 1, 1976, Ser. No. 746,587

Int. Cl.² G03B *15/02*

U.S. Cl. 362—10 **17 Claims**

1. In a flash assembly adapted to be alternately mounted on a camera in first and second orientations and including at least one unfired flash lamp in operative relationship with the camera only when said flash assembly is mounted on said camera in said first orientation and at least one other unfired flash lamp in operative relationship with the camera only when said flash assembly is mounted on the camera in said second orientation, said flash assembly further including one means for indicating that said first flash lamp has not been fired and another means for indicating that said other flash lamp has not been fired, both said one and said other indicating means comprising means actuatable from an initial condition indicating that its said respective lamp has not yet been fired to a subsequent condition indicating that its said respective lamp has been fired, the improvement comprising: means automatically responsive to said flash assembly being mounted on the camera in said first orientation, when the camera is disposed in its normal flash mode operating position, for controlling said other means for indicating so as to at least obscure the indication of its initial condition and responsive to said flash assembly being mounted on the camera in said second orientation, when the camera is disposed in its said normal flash mode operating position, for controlling said one means for indicating so as to at least obscure the indication of its initial condition such that only the indicating means of the operatively mounted lamp is effective for indicating to the operator its said initial condition.

4,109,303

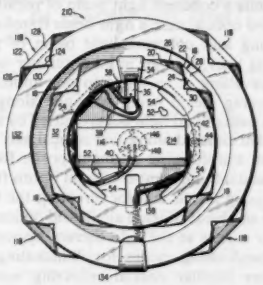
FLUORESCENT LIGHT FIXTURE

Joseph F. Hetherington, Levittown, Pa., assignor to Joseph F. Hetherington, Levittown, Pa.

Filed Jul. 26, 1976, Ser. No. 708,647

Int. Cl.² H05B *33/02*

U.S. Cl. 362—216 **11 Claims**



1. A fluorescent light fixture adapted to be mechanically connected to an internally threaded incandescent-type lamp socket disposed within means having a planar supporting surface, comprising:

an externally threaded incandescent-type lamp plug for threadedly-engaging said socket;

an electrical ballast member electrically connected to said plug;

at least one fluorescent light element electrically connected to said ballast member; and

means for mounting and supporting said plug, said ballast member, and said fluroescent light element upon at least one surface thereof, the surface upon which said plug is mounted being planar, wherein said mounting means comprises a flat plate which includes means integral therewith for mounting and supporting said light element thereon and wherein said plate has a square configuration, and is fabricated of a semi-rigid, flexible, and resilient plastic, the corners of said square plate being permanently deformed so as to overlap the remaining base portion of said plate in a spaced relationship therewith and thereby define therewith a socket within which said light element may be disposed.

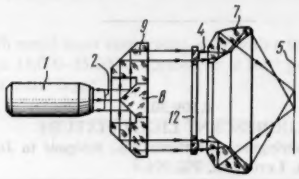
whereby said integral mounting means comprises said deformed corner portions which thereby define semi-rigid, flexible and resilient clip members overlapping said light element so as to removably secure said light element witin said socket in a snap-in fashion and whereby when said plug is threadedly engaged with said socket, said planar surface of said mounting means is able to be stably mounted upon said supporting surface in a flush manner.

4,109,304

DEVICE FOR COHERENT LIGHTING OF OBJECTS

Vladimir Vasilievich Khvalovsky, ulitsa S. Kovalevskoi, 13, korpus 3, kv. 79; Sergei Nikolaevich Natarovsky, Lermontovsky prospekt, 8/10 kv. 17, both of Leningrad; Valentin Iosifovich Nalivaiko, Akademichesky gorodok, ulitsa Shkolnaya, 5, kv. 48, Moskovskaya oblast, Podolsky raion, and Vladimir Lvovich Vorontsov, ulitsa Kustodieva, 20, korpus 1, kv. 39, Leningrad, all of U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,382
Int. Cl.[2] F21V *11/00*
U.S. Cl. 362—259 **5 Claims**



1. A device for coherent lighting of objects, comprising: a laser which emits a coherent light beam of parallel rays along a predetermined optical axis; a light beam transforming means for transforming said coherent light beam of parallel rays, emitted by said laser, into an infinite number of parallel-ray light beams travelling at an angle to one another, said light beam transforming means being arranged along said optical axis across the path of said light beam emitted by said laser, and condenser means situated along said optical axis at the side of said light-beam transforming means opposite from said laser for receiving said infinite number of light beams from said light beam transforming means and for directing the thus-received light beams to an object situated along said optical axis beyond said condenser means at the side thereof opposite from said light beam transforming means for illuminating said object, inner and outer annular coaxial reflecting means arranged along said optical axis across the path of said light beam, between said laser and said light beam transforming means, said inner and outer reflecting means respectively including annular reflecting surfaces each of which forms at least part of a cone whose axis coincides with said optical axis and whose vertex is pointed toward said laser away from said light beam transforming means, said inner reflecting means receiving light from said laser and directing the latter light radially away from the optical axis and said outer reflecting means receiving the light from said inner reflecting means and redirecting the same along a cylinder which coaxially surrounds said optical axis, thus forming a cylindrical beam of light received by said light beam transforming means and transmitted by the latter to said condenser means.

4,109,305

RELOCATABLE SUSPENDED LIGHT FIXTURE

Donald F. Claussen, Willow Street, and Ronald A. Gagnon, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 23, 1976, Ser. No. 679,693
Int. Cl.[2] F21S *3/00*; F21V *19/02*
U.S. Cl. 362—418 **3 Claims**

1. A suspended ceiling system with relocatable lighting means,

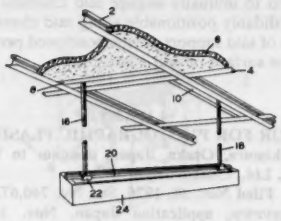
(a) said suspended ceiling system comprising:

(1) runner members with horizontal flanges forming a grid system, and

(2) ceiling boards mounted on the horizontal flanges of the runner members,

(b) said relocatable lighting means comprising:

(1) at least two track means, each of said track means being removably supported by a horizontal flange of at least two runner members, said track means being readily removable from one part of the ceiling system to another part of the ceiling system, each of said track means having a horizontal flange to support the edge of the ceiling board formerly supported by the horizontal flange of the runner member now supporting the track means, and



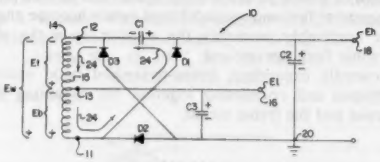
(2) means for supporting a light fixture from said track means, said means for supporting the light fixture from the track means being at least two support posts, one end of each post being movably connected to the track means with the opposite ends of the support posts being connected to the light fixture.

4,109,306

POWER SUPPLY

William B. Mason, Arlington, Tex., assignor to Teccor Electronics, Inc., Euless, Tex.

Filed Oct. 6, 1977, Ser. No. 839,803
Int. Cl.[2] H02M *7/10*
U.S. Cl. 363—61 **7 Claims**



1. A power supply, for use with a transformer winding having first and second terminals and an intermediate terminal therebetween, said lower power supply comprising:

output terminals for a low voltage, higher voltage and a common voltage;

a first diode connected from said first winding terminal to said higher voltage output terminal;

a second diode connected from the first winding terminal to the common terminal, said diodes being connected to conduct oppositely with respect to current flowing from said first winding terminal;

a first capacitor connected from the higher voltage terminal to said second terminal;

a second capacitor connected from the higher voltage terminal to the common terminal;

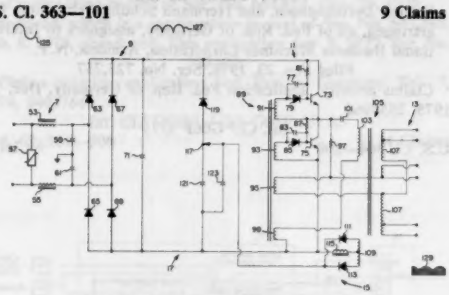
a third capacitor having one lead thereof connected both to said intermediate winding terminal and to said low voltage terminal, and

a third diode connected from the common terminal to the second winding terminal, said second and third diodes being connected to conduct in the same direction with respect to current flowing from said common terminal.

4,109,307
HIGH POWER FACTOR CONVERSION CIRCUITRY

William C. Knoll, Turbotville, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 4, 1977, Ser. No. 793,875
Int. Cl.[2] H02M 7/00
U.S. Cl. 363—101 9 Claims

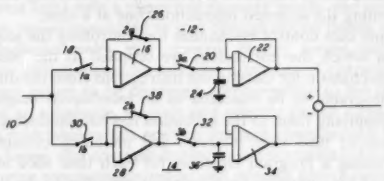


1. A high power factor conversion circuit comprising:
an AC potential source;
a full-wave DC rectifier means coupled to said AC potential source and providing a pulsating DC potential;
a high frequency inverter means coupled to said DC rectifier means and including a series connected inductor and capacitor circuit;
a load circuit coupled to said series connected inductor and capacitor circuit of said high frequency inverter means;
a feedback rectifier circuit means coupled to said high frequency inverter means; and
feedback circuit means including a series connected isolating diode and charge storage capacitor shunting said DC rectifier means with a junction therebetween coupled to said feedback rectifier circuit whereby high frequency energy from said inverter means is applied to said charge storage capacitor and utilized to convert said pulsating DC potential to a substantially uniform DC potential.

4,109,308
CIRCUIT FOR CONVERTING A.C. VOLTAGE INTO A D.C. VOLTAGE

Günther Georg Rödel, Uhldingen-Muhlhofen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., Gmbh, Uberlingen, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,165
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626927
Int. Cl.[2] H02M 7/12
U.S. Cl. 363—125 10 Claims

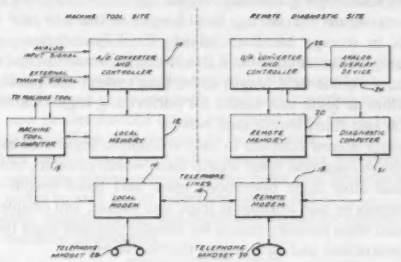


1. A circuit for converting an a.c. voltage into a d.c. voltage comprising, in combination:
a first and second channel respectively associated with alternate half-waves of an applied a.c. voltage to be converted and the other alternate half-waves of the applied a.c. voltage to be converted, each channel comprising:
an integrator circuit with an input and an output;
a first controlled switch coupled between the applied a.c. voltage to be converted and said integrator circuit input for connecting the applied a.c. voltage to be converted to said integrator circuit input during the half-wave of said a.c. voltage associated with the channel in which said integrator circuit is located;
an analog memory circuit for storing an analog signal;
a second controlled switch coupled between said integrator circuit output and said analog memory and operative during a part of the half-wave which the channel is not associated with to connect said integrator circuit output to said memory circuit; and
a differential amplifier coupled to each said analog memory to form the d.c. voltage.

4,109,309
METHOD AND APPARATUS FOR REMOTE DISPLAY OF ANALOG SIGNALS OCCURRING IN COMPUTER CONTROLLED MACHINE TOOLS

Richard Johnstone, and Lyle D. Ostby, both of Brookfield, Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Feb. 9, 1977, Ser. No. 767,142
Int. Cl.[2] G06F 3/05, 15/46
U.S. Cl. 364—120 17 Claims

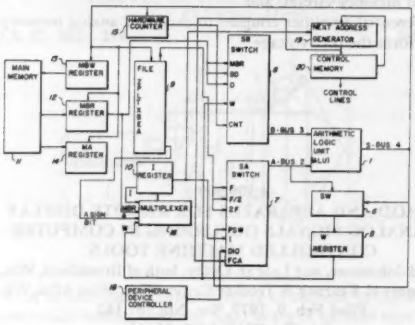


1. Apparatus for displaying an analog signal which occurs in a computer controlled machine tool circuit on an analog display device which is located in a site remote from the machine tool site, comprising:
probe means for picking up the desired analog signal in said machine tool circuit;
an analog to digital converter coupled to the output of said probe means for converting said analog signal into a sequence of digital signals each of which represents the instantaneous amplitude of said analog signal at a corresponding time;
means for applying the digital output of said analog to digital converter to a first memory which is associated with said machine control computer for storage;
means for transmitting said sequence of digital signals stored in said first memory to said remote site;
means at said remote site for receiving said transmitted sequence of digital signals;
a second memory at said remote site;
means for applying said received sequence of a digital signals to said second memory for storage;
a digital to analog converter at said remote site;
means for applying said sequence of digital signals stored in said second memory to said digital to analog converter for conversion into an approximation of said analog signal; and
analog display means coupled to the output of said digital to analog converter for displaying said approximation of said analog signal.

4,109,310
VARIABLE FIELD LENGTH ADDRESSING SYSTEM HAVING DATA BYTE INTERCHANGE

Alfred W. England, Los Angeles; Louis M. Krasny, Beverly Hills, and Edward F. Narey, Carson, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 6, 1973, Ser. No. 385,763
Int. Cl.[2] G06F *9/12, 13/00*
U.S. Cl. 364—200 3 Claims



1. In a microprogrammable digital computer including main memory means for storing fixed length instruction and data words in storage locations having fixed boundaries corresponding to the length of said fixed length instruction and data words, a varible field length addressing system comprising:

arithmetic logic unit means for performing logic operations on said fixed length data words,

register means coupled to said arithmetic logic unit means for storing said fixed length data words prior to, during, and after logic operations upon said fixed length data words by said arithmetic logic unit means, and coupled to said main memory means for transferring said fixed length instruction and data words therebetween,

control memory means responsive to said fixed length instruction words stored in said register means for branching to a corresponding plurality of microinstruction subroutines stored internally in said control memory means to accomplish an instruction's requested variable field length addressing function, for executing said microinstruction subroutines, and for executing said branching to any one of a plurality of microinstruction subroutines in one execution cycle, said control memory means being coupled to said register means and said arithmetic logic unit means to control performance of said variable field length addressing function, said control memory means comprising:

a microinstruction subroutine for determining the type, number and sequence of operations to be performed by said arithmetic logic unit means and said register means to enable implementation of the variable field length addressing function,

next address generator means responsive to said microinstruction subroutine and to the state of said register means for determining the location of the next microinstruction to be executed, and for executing it,

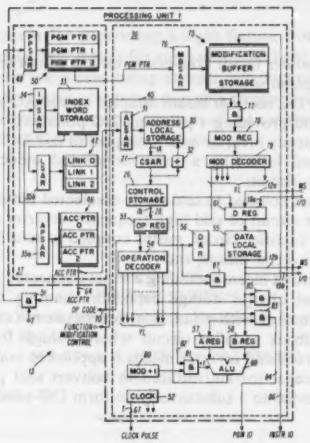
control line means responsive to said microinstruction subroutine and coupled to said register means and said arithmetic logic unit means for carrying signals that force said arithmetic logic unit means and said register means to perform those operations determined by said microinstruction subroutine, and

said register means includes swapping circuit means for interchanging portions of a fixed length data word stored in said register means during a single microinstruction subroutine execution cycle.

4,109,311
INSTRUCTION EXECUTION MODIFICATION MECHANISM FOR TIME SLICE CONTROLLED DATA PROCESSORS

Arnold Blum, Gechingen; Horst von der Heyden, Boeblingen; Fritz Irro, Boeblingen; Stephan Richter, Boeblingen; Helmut Schaal, Dettenhausen, and Hermann Schulze-Schoelling, Gaertringen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 23, 1976, Ser. No. 725,757
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, 2555963
Int. Cl.[2] G06F *9/19*
U.S. Cl. 364—200 6 Claims



1. In a data processing system, the combination comprising:

an instruction storage mechanism for storing instructions belonging to a plurality of different programs and including an address mechanism for accessing the stored instructions;

an instruction execution mechanism for receiving and executing the accessed instructions one at a time;

a time slice control mechanism for controlling the sequence in which the instructions are supplied to the execution mechanism for causing the instructions from the different programs to be executed in an interleaved manner by supplying them to the execution mechanism during interleaved time slice intervals and including circuitry for issuing a program identifier for each time slice interval and for supplying each program identifier to the instruction storage address mechanism for determining the program to be accessed during a particular time slice interval;

circuitry for supplying condition signals representing the occurrences of predetermined conditions in the data processing system;

and a function modification mechanism responsive to the occurrence of a predetermined program identifier and one of the condition signals for modifying the function of at least one of the instructions in the program identified by such program identifier.

4,109,312
METHOD AND APPARATUS FOR MEASURING AND INDICATING THE UNBALANCE OF A ROTOR

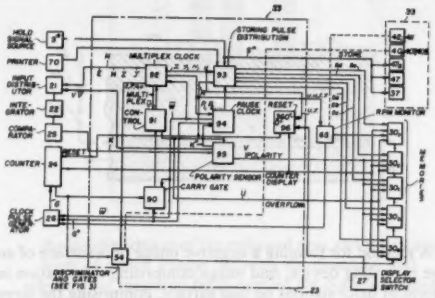
Rudolf Beutel, Traisa, Fed. Rep. of Germany, assignor to Firma Carl Schenk AG, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,453, Dec. 29, 1975, abandoned, which is a continuation-in-part of Ser. No. 547,345, Feb. 5, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,918

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1974, 2405764

Int. Cl.[2] G01M *1/22;* G06F *15/20*

U.S. Cl. 364—508 14 Claims



1. A circuit arrangement for the digital display of unbalance representing analog input signals derived from a rotor rotating at a given rpm, comprising analog input signal distributor means for receiving said analog input signals, source means of reference signals, control circuit means, signal integrating means and polarity determining circuit means connecting said input signal distributor means to said control circuit means in that order, clock pulse generator means and counter means connected to said control circuit means to determine the duration of each signal integration by said integrating means for deriving digital signals corresponding to said analog input signals, a plurality of memory means, said control circuit means being connected to supply digital values corresponding to said digital signals to said memory means, a corresponding plurality of indicator units, means interconnecting each of said indicator units with a respective memory means, and constant display means connected to said control circuit means and to said indicator units, said constant display means including selector switch means for selecting a number of characteristic constant values to be displayed corresponding to the dimension of an unbalance, wherein said selector switch means provide a selectable switch position for each characteristic value, and wherein said constant display means comprise logic signal combining means connected to said selector switch means for combining the signals received from said selector switch means in accordance with said characteristic constant values, said logic signal combining means being further connected to receive control signals from said control circuit means to determine the storing of combined signals in said logic signal combining means, said logic signal combining means further comprising decoder means for decoding the combined signals, said decoder means being connected to said indicator units for determining the digital display of the unbalance representing signals with their respective units and the decimal point position.

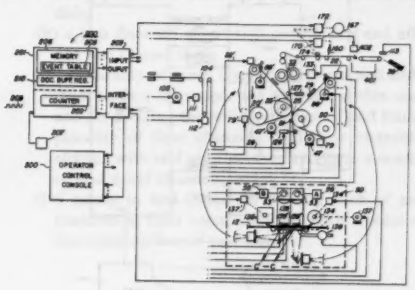
4,109,313
PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

James M. Donohue, Los Alamitos, Calif., and Bernard C. Fisk, Dallas, Tex., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 496,662, Aug. 12, 1974. This application Nov. 3, 1975, Ser. No. 628,019

Int. Cl.[2] G06F *15/20;* G03G *15/00*

U.S. Cl. 364—518 6 Claims



1. In an electrostatic type reproduction machine for producing copies of originals, the machine having a movable photoreceptor and a series of discretely operated components cooperable with the photoreceptor and one another to electrostatically produce copies, the combination of:

counting means for generating an actuating signal when said counting means reaches a preset reference count;

control means to successively reset said counting means to a new predetermined count associated with the next one of said machine components to be operated;

clock means to drive said counting means whereby said counting means counts starting from said predetermined count to said preset reference count; and

means responsive to said actuating signal to operate said machine component.

4,109,314
AUTOMATIC FRUIT ANALYZER

Stephen F. Meyer, Columbus; Amiel R. Helle, Westerville, and Leo J. Niese, Toledo, all of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Dec. 8, 1976, Ser. No. 748,850

Int. Cl.[2] G06F *15/46;* G01N *33/02*

U.S. Cl. 364—552 2 Claims

1. A liquid analyzer for testing liquid comprising:

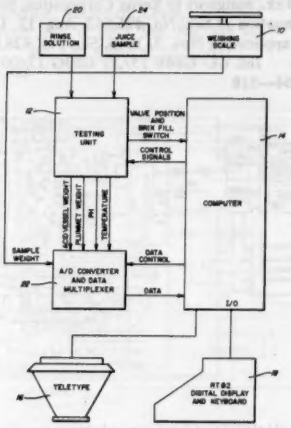
(a) a soluble solids testing means for use in determining the soluble solids content of said liquid, said soluble solids testing means including a first vessel for receipt of a quantity of liquid, a plummet suspended in said first vessel from a first weight transducer, and a temperature transducer for detecting the temperature of said sample;

(b) an acid testing means for use in determining the acid content of said liquid, said acid testing means including a second vessel for receipt of a quantity of liquid and supported by a second weight transducer, a PH transducer mounted to detect the PH of said sample, a stirrer for mixing the contents of said second vessel and an alkali source connected through an alkali inlet valve to deliver alkali to said second vessel;

(c) a network of valved fluid conveying conduits interconnected with said soluble solids testing means and said acid testing means; and

(d) controlling, computing and storage means associated with said soluble solids testing means, said acid testing means, and said fluid conveying conduits for automatically recording data representing the weight of said plummet suspended in said first vessel when empty, for loading liquid through said fluid conveying conduits into said

vessels, for recording data representing the temperature of the liquid in said first vessel, the weight of the plummet in said liquid and the weight of the liquid in said second vessel, for actuating the stirrer, for opening the alkali inlet



valve and delivering alkali into the quantity of liquid to titrate said quantity of liquid to a selected PH, for recording data representing the weight of the titrated second quantity of liquid in the second vessel, and for computing the acid and soluble solids content of said liquid.

4,109,315

WRISTWATCH CALCULATOR WITH SELECTIVELY SCANNED KEYBOARD

Michael Pan, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 30, 1976, Ser. No. 718,741

Int. Cl.[2] **G06F** *7/38, 15/02;* **G04B** *19/30*

U.S. Cl. 364—705 **1 Claim**

1. A watch calculator comprising:

a keyboard having key switches arranged in a matrix having rows and columns of key switches;

keyboard scanner means connected to the keyboard including row and column scanning circuits for scanning the rows and columns of key switches to detect and locate a closed key switch;

calculator circuit means coupled to the keyboard scanner means for accepting and performing arithmetic operations on numerical entries from the keyboard;

display means connected to the calculator circuit means for displaying numerical data;

watch circuit means connected to the display means for storing and periodically updating data representing time; and

mode control means coupled to the calculator circuit means and the keyboard scanner means for placing the calculator circuit means in an active mode upon the actuation of one of a predetermined number of key switches in the keyboard and placing the calculator circuit means in an inactive mode in response to the completion of an arithmetic operation by the calculator circuit means, and for producing a signal to inhibit the keyboard scanner means when the calculator circuit means is in the active mode.

4,109,316

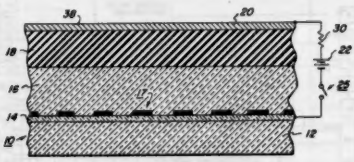
METHOD AND APPARATUS FOR INVERTING THE POLARITY OF AN INPUT IMAGE FORMED ON A SURFACE OF AN IMAGE RECORDING DEVICE

Jan S. Snyder, Upland, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1976, Ser. No. 650,827

Int. Cl.[2] **G11C** *13/00*

U.S. Cl. 365—127 **25 Claims**



1. A method for forming a negative image on a surface of an image recording device, said image comprising information in the form of deformations on said surface, comprising the steps of:

(a) providing an image recording device comprising a layer of photoconductive material, an electric field deformable elastomer layer adjacent said layer of photoconductive material and a deformable conductive layer adjacent said elastomer layer,

(b) subjecting said image recording device to an electric field,

(c) generating illuminating radiation to which the photoconductive layer is responsive,

(d) illuminating said photoconductive layer with said radiation whereby substantially uniform deformations are created on said elastomer layer,

(e) removing the electric field applied to said image recording device,

(f) modulating said radiation in accordance with information to be formed on said elastomer layer as deformations, and

(g) directing said information modulated radiation to selected areas of said image recording device whereby the deformations created on said elastomer layer which correspond to said selected areas are erased.

4,109,317

MAGNETIC THIN FILM STORAGE DEVICE

Herbert Henkler; Hermann Deichelmann; Roland Koenig; Volker Koch, all of Ludwigshafen, and Bernd Roeger, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 20, 1976, Ser. No. 659,895

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1975, 2509287

Int. Cl.[2] **G11C** *19/08*

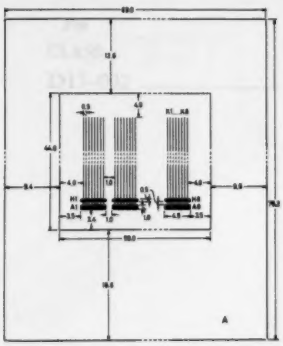
U.S. Cl. 365—133 **2 Claims**

1. A magnetic thin film storage device, comprising a flat support to which a ferromagnetic layer has been applied, which layer contains regions of different coercivity, lower-coercivity regions in the form of strip-like channels and enlarged areas being surrounded by regions of higher coercivity, and also comprising electric conductor means extending in planes parallel with the support and serving to produce local

magnetic fields required to propagate magnetic domains into the lower-coercivity regions;

wherein there are provided groups of straight parallel channels, with all the channels of a group terminating in one enlarged area;

wherein the magnetic field needed for selecting a channel within a group is produced by means of a comb-like arrangement of electric conductors, the longitudinal conductor of which crosses all the channels of the group in



the neighborhood of the enlarged area and the connecting leads of which extend between the channels; and

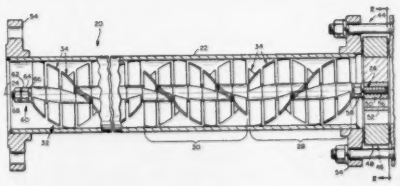
wherein the magnetic fields needed for domain propagation and shrinkage is produced by a single conductor covering the entire enlarged area as well as the adjacent channel regions so that said conductor when activated causes the magnetic domains present in the channels terminating in said enlarged area to be propagated, individually and consecutively, into said enlarged area.

4,109,318

FLUID INJECTION AND SAMPLING DEVICE FOR AN IN-LINE BLENDER

William F. Hutchings, Fairport, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Apr. 15, 1977, Ser. No. 788,096
Int. Cl.[2] B01F *5/00*
U.S. Cl. 366—140 **6 Claims**



1. A device for mixing a fluid comprising:

(a) a conduit having a hollow interior disposed about a central axis;

(b) a shaft extending longitudinally through said conduit along said axis;

(c) a plurality of stationary mixing stages extending in series along said axis within said conduit, each of said mixing stages defining a plurality of spiral channels within the hollow interior of said conduit; and

(d) retaining means affixed to said shaft at one end thereof, said retaining means being adapted to prevent axial movement of said shaft within said conduit and comprising:

(i) a frame having an outer surface and a hollow interior defining an inner surface therefor, said inner surface being disposed about said central axis, and said frame being positioned axially adjacent one end of said conduit;

(ii) a hub disposed about said central axis and affixed to one end of said shaft;

(iii) a plurality of vanes connected to said hub and to said inner surface for supporting said hub within said frame and for dividing the hollow interior of said frame into a plurality of flow channels, said flow channels being aligned with said spiral channels to form a continuation of said spiral channels; and

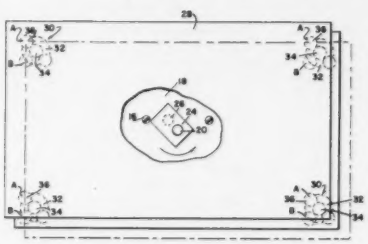
(iv) means in said frame for placing each of said flow channels in fluid communication with a point external the outer surface of said frame.

4,109,319

AGITATOR FOR LABORATORY TUBES AND FLASKS AND THE LIKE

J. Wayne Brandt, Lutherville, Md., assignor to Spectroderm International, Fairfax, Va.

Filed Dec. 18, 1975, Ser. No. 642,231
Int. Cl.[2] B01F *11/00*
U.S. Cl. 366—219 **3 Claims**



1. An agitator testing device comprising a housing with a horizontal top forming a lower plate, another plate disposed in spaced relationship with said lower plate and forming an upper plate, a single eccentric member disposed centrally of said upper plate and rigidly secured thereto by a single vertical pin extending downwardly from the upper plate and extending into said eccentric and secured thereto for rotation therewith, at least three bearing means disposed equally about said eccentric member, each bearing means comprising circular flanges secured to the top surface of said lower plate with central upwardly extending pins, and downwardly extending pins secured to said upper plate having there bottom ends resting on said circular flanges and their sides in frictional contact with said central upwardly extending pin but without being fixedly secured thereto, and a motor disposed centrally of said housing having a shaft extending through said lower-plate and directly and fixedly connected to said eccentric to permit translating orbital movement of the upper plate.

DESIGN PATENTS

GRANTED AUG. 22, 1978

ERRATA

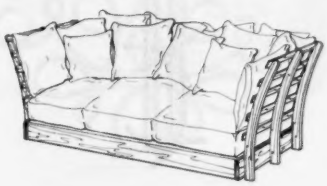
For CLASS	See PATENT NO.
D15-032	249,088

DESIGNS

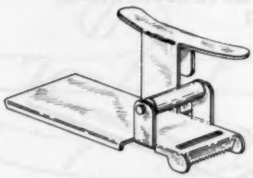
AUGUST 22, 1978

248,996
HAIRBRUSH
Renato Brunas, c/o Renbow International Ltd., 44 B Islington Park St., London, England
Continuation of Ser. No. 729,468, Oct. 4, 1976, abandoned. This application Nov. 29, 1976, Ser. No. 745,761
Claims priority, application United Kingdom, Apr. 2, 1976, 975161/76
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35

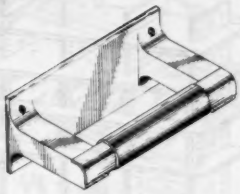
248,997
SOFA OR THE LIKE
Jim Peed, 1405 - 6th Street Cir., NW., Hickory, N.C. 28601
Filed Jun. 24, 1976, Ser. No. 699,320
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



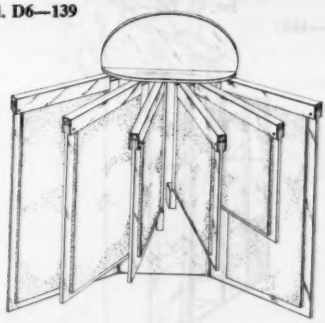
248,998
COMBINED TOILET PAPER HOLDER AND SHELF FOR LAVATORIES
Jan G. L. S. Kullenbäck, Wrangelsgatan 7B, Göteborg, Sweden
Filed May 5, 1976, Ser. No. 683,500
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—91



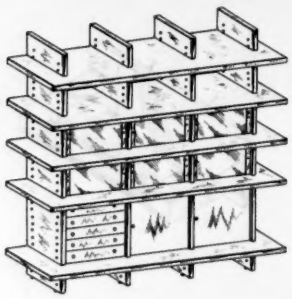
248,999
PAPER ROLL HOLDER
Bennie L. House, P.O. 577, Hickory Ridge, Ark. 72347
Filed Apr. 4, 1977, Ser. No. 784,621
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97



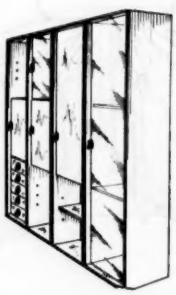
249,000
DISPLAY STAND FOR JEWELRY CHAIN
Earle G. Simmons, 25 Westchester Way, Warwick, R.I. 02886
Filed Aug. 15, 1977, Ser. No. 824,844
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—139



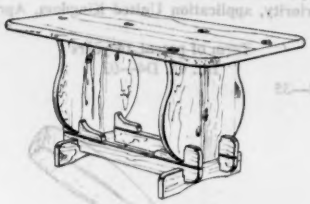
249,001
STORAGE SHELF UNIT
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Italy
Filed Jul. 14, 1975, Ser. No. 595,406
Claims priority, application Italy, Jan. 15, 1975, 60905 B/75; Jan. 15, 1975, 60904 B/75
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



249,002
CABINET
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Italy
Filed Mar. 15, 1976, Ser. No. 667,159
Claims priority, application Italy, Sep. 15, 1975, 22283 B/75
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164

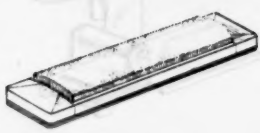


249,003
TABLE
Thomas A. Alexander, 1318 Yale St., Apt. A, Santa Monica, Calif. 90404
Filed Dec. 3, 1976, Ser. No. 747,260
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



249,004
STAND FOR POTTED PLANTS
Richard G. Crouse, 35 Sherwood Rd., Cockeysville, Md. 21030
Filed Apr. 18, 1977, Ser. No. 788,688
Term of patent 14 years
Int. Cl. D6—*04, 06*
U.S. Cl. D6—145

249,005
SHOWER CURTAIN HOLDER
Waldo Dezura, Apt. 601, 235 Keith Rd. West, Vancouver, British Columbia, Canada
Filed Jul. 19, 1976, Ser. No. 706,284
Term of patent 14 years
Int. Cl. D6—*10;* D23—*02*
U.S. Cl. D6—208.1

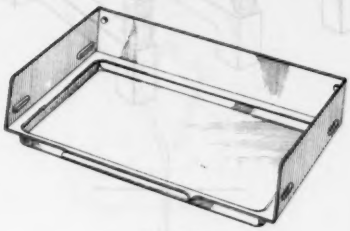


249,006
SHOWER CURTAIN HOLDER
Waldo Dezura, Apt. 601, 235 Keith Rd. West, Vancouver, British Columbia, Canada
Filed Jul. 19, 1976, Ser. No. 706,285
Term of patent 14 years
Int. Cl. D6—*10;* D23—*02*
U.S. Cl. D6—208.1

249,007
SCARF HANGER
Gladys Knobel, 340 Greenbay Rd., Glencoe, Ill. 60022, and Theodore Prisland, 632 Melody La., Highland Park, Ill. 60035
Filed Sep. 30, 1977, Ser. No. 838,212
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247

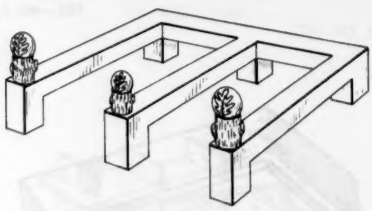
249,008
HANGER
Herbert Levitt, Yonkers, N.Y., assignor to Warnaco Inc.
Filed Jan. 26, 1978, Ser. No. 872,743
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—254

249,009
BROILER PAN OR SIMILAR ARTICLE
Lawrence L. Grove, Allentown, and Paul V. Snyder, Whitehall, both of Pa., assignors to General Electric Company
Filed Jun. 14, 1976, Ser. No. 696,119
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—91

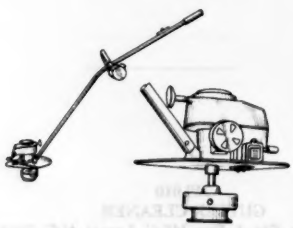


249,010
GUTTER CLEANER
Grover C. Currie, Rte. 1, Box 345-C, Lenoir, N.C. 28645
Filed Sep. 13, 1976, Ser. No. 722,680
Term of patent 14 years
Int. Cl. D7—*05;* D23—*01*
U.S. Cl. D7—161

249,011
FIREPLACE GRATE
Rodger L. Jones, and Hoyt A. Scott, both of 1137-2 N. Fayetteville St., Asheboro, N.C. 27203
Filed Mar. 10, 1977, Ser. No. 776,467
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—207



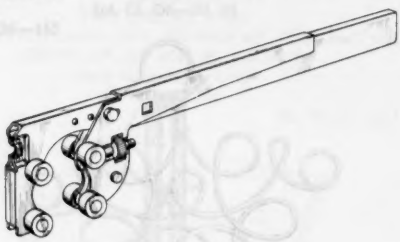
249,012
WEED CUTTER
Robert G. Everts, 2118 E. Birchwood Ave., Mesa, Ariz. 85204
Filed Mar. 29, 1976, Ser. No. 671,347
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8



249,013
GOLF SAND-TRAP SMOOTHING IMPLEMENT
Edward W. Carman, P.O. Box V, Elmer, N.J. 08318
Continuation-in-part of Ser. No. 712,267, Aug. 6, 1976, abandoned. This application Nov. 12, 1976, Ser. No. 741,482
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—13

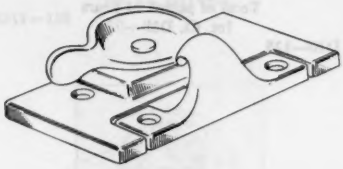
249,014
IMPLEMENT FOR FINISHING JOINTS BETWEEN TILES
Johannes Groeneveld, Hauptstrasse 51, D-6 Frankfurt am Main-Kalbach, Fed. Rep. of Germany
Filed Mar. 1, 1976, Ser. No. 662,466
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 73 AR 509/75
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—45

249,015
PIPE CUTTER
Bruce Ernest Matthews, Warrandyte, and Ronald Day, Mt. Evelyn, both of Australia, assignors to The Stanley Works Pty. Ltd., Nunawading, Australia
Filed Feb. 16, 1977, Ser. No. 769,030
Claims priority, application Australia, Aug. 19, 1976, 69866/76
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—60

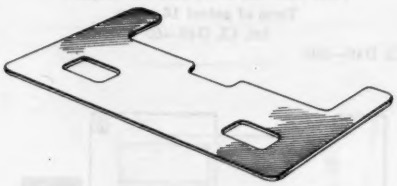


249,016
HANDLE FOR FURNITURE DOORS, DRAWERS OR THE LIKE
Roland Spellier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Fed. Rep. of Germany
Filed Jan. 30, 1976, Ser. No. 653,854
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1975, 6 AR 137/75
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—306

249,017
SASH LOCK
Michael Costello, 304 Meridian St., East Boston, Mass. 02128
Filed Aug. 25, 1977, Ser. No. 827,817
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—337



249,018
GUARD PLATE FOR A SASH LOCK
Michael Costello, 304 Meridian St., East Boston, Mass. 02128
Filed Aug. 25, 1977, Ser. No. 827,818
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—343

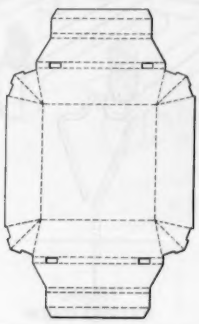


249,019
COMBINED HOOK AND ANCHORAGE CASING
Lars Fredriksson, Växjö, Sweden, assignor to K A Bergs Smide AB
Filed Nov. 13, 1975, Ser. No. 631,470
Claims priority, application Sweden, May 14, 1975, 751022
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

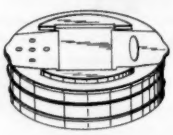
249,020
CARGO HOLD DOWN BINDER
John Raniero, Box 204, Gearhart, Oreg. 97138
Filed Dec. 20, 1976, Ser. No. 752,882
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382

249,021
JAR
Floyd E. Pettengill, Lancaster, Ohio, assignor to General Foods Corporation, White Plains, N.Y.
Division of Ser. No. 567,462, Apr. 14, 1975, Pat. No. Des. 242,222. This application Aug. 24, 1976, Ser. No. 717,071
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—85

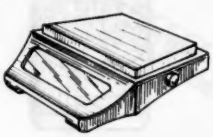
249,022
BLANK FOR A DISPOSABLE TRAY
Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.
Filed Sep. 13, 1976, Ser. No. 722,616
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



249,023
DISPENSING TOP FOR GRANULATED MATERIAL
John B. Ames, 100 Valley Rd., Marion, Ala. 36756
Filed Jul. 29, 1976, Ser. No. 709,596
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—257

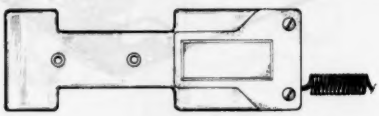


249,024
INCLINED VIEWING DIGITAL WRISTWATCH CASE
Marvin Ackerman, 856 Somerset Dr., Sunnyvale, Calif. 94087
Filed Nov. 22, 1976, Ser. No. 743,715
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30



249,025
DIAL FOR CLOCK
Kenji Nakamura, Kamakura, Japan, assignor to L C Chemical Company, Limited, Tokyo, Japan
Filed Aug. 25, 1975, Ser. No. 607,183
Claims priority, application Japan, Mar. 28, 1975, 50-12226
The portion of the term of this patent subsequent to May 10, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125

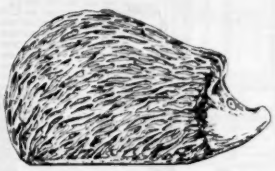
249,026
MONEY CLIP ALARM UNIT FOR CASH REGISTERS AND THE LIKE
Mark Norman Lepow, Santa Ana, Calif., assignor to American Security Equipment Company, Carson, Calif.
Filed Mar. 23, 1977, Ser. No. 780,654
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



249,027
ORNAMENT
Joseph Dibble, 577 Market St., Elmwood Park, N.J. 07407
Filed Mar. 8, 1977, Ser. No. 775,537
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—125

249,028
STATUETTE
William Raymond Bossons, Congleton, England, assignor to W. H. Bossons (Sales) Ltd.
Filed Mar. 11, 1977, Ser. No. 776,546
Claims priority, application United Kingdom, Oct. 26, 1976, 977642/76
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

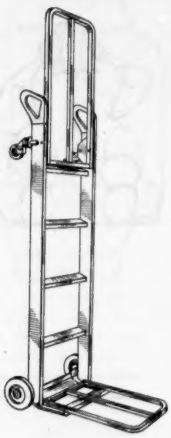
249,029
STATUETTE
William Raymond Bossons, Congleton, England, assignor to W. H. Bossons (Sales) Ltd.
Filed Mar. 11, 1977, Ser. No. 776,547
Claims priority, application United Kingdom, Oct. 26, 1976, 977643/76
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158



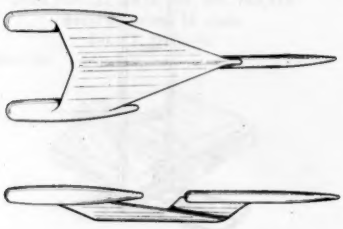
249,030
STATUETTE
William Raymond Bossons, Congleton, England, assignor to W. H. Bossons (Sales) Ltd.
Filed Mar. 11, 1977, Ser. No. 776,548
Claims priority, application United Kingdom, Oct. 26, 1976, 977641/76
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

249,031
COMBINED HAND TRUCK AND LADDER
Phil Keith Tarran, San Diego County, Calif., assignor to Lords III Research & Development Co., Escondido, Calif.
Filed Mar. 25, 1977, Ser. No. 781,421
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—25

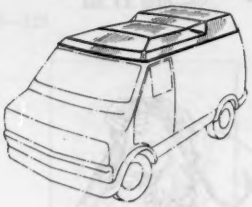
249,032
COMBINED HAND TRUCK AND LADDER
Phil Keith Tarran, County of San Diego, Calif., assignor to Lords III Research & Development Co., Escondido, Calif.
Filed Mar. 25, 1977, Ser. No. 781,440
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—25



249,033
BOAT HULL
Francis Norman Potter, The Willow, 116 Main St., Burton-Joyce, Nottingham NG 14 5EP, England
Filed Aug. 20, 1976, Ser. No. 716,207
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



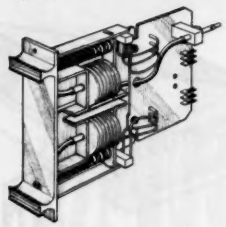
249,034
VAN TOP
Stanley Gene Snyder, 1100 Pioneer Way, El Cajon, Calif. 92020
Filed Feb. 4, 1977, Ser. No. 765,444
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



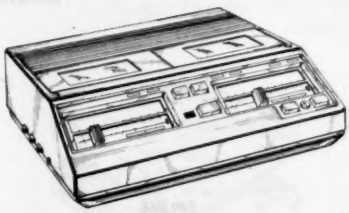
249,035
FLEXIBLE AUTOMOBILE SKI RACK
Wayne L. Martin, 36 Cuesta Way, Walnut Creek, Calif. 94596
Filed Mar. 14, 1977, Ser. No. 777,018
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

249,036
KNAPSACK FOR A MOTORCYCLE SISSY BAR
Michael W. Ramalia, 207 Perrin, Ypsilanti, Mich. 48197, and William H. Meisling, 325 Becket, Brighton, Mich. 48116
Filed May 26, 1976, Ser. No. 690,232
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—158

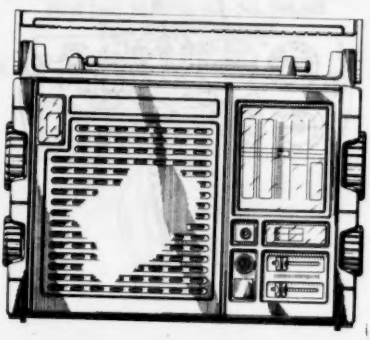
249,037
COMPRESSION SWITCH
Walter Metz, Moosebrunn, Fed. Rep. of Germany, assignor to Metz Mannheim GmbH, Mannheim, Fed. Rep. of Germany
Filed Sep. 16, 1976, Ser. No. 723,997
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



249,038
DICTATING MACHINE
David K. Walz, 1534 N. Decatur Rd., NE., Atlanta, Ga. 30333
Filed Sep. 24, 1976, Ser. No. 726,156
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—3

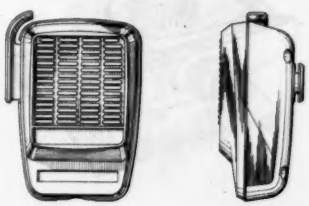


249,039
PORTABLE RADIO
John T. Houlihan, Fayetteville, N.Y., assignor to General Electric Company
Filed Jun. 11, 1976, Ser. No. 695,172
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

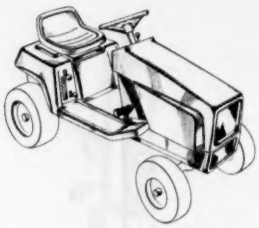


249,040
CENTER LOADED CITIZENS BAND ANTENNA
Don L. Hermansen, 2990 S. Holly Pl., Denver, Colo. 80222, and Ben H. Davis, Jr., Star Rte. 90-A, Morrison, Colo. 80465
Filed Aug. 23, 1976, Ser. No. 716,597
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—86

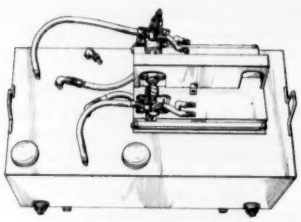
249,041
CB MICROPHONE OR SIMILAR ARTICLE
Richard Culbertson, Manlius, N.Y., assignor to General Electric Company
Filed May 2, 1977, Ser. No. 793,179
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—12



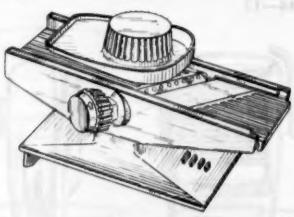
249,042
LAWN AND GARDEN TRACTOR
Darrell W. Hinklin, Richfield, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Jul. 28, 1977, Ser. No. 820,019
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D15—23



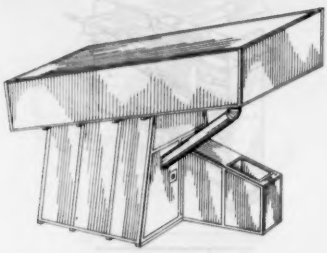
249,043
SPRAY CLEANING UNIT
Thomas J. McMullen, 5529 Park Ave. South, Minneapolis, Minn. 55417
Filed Apr. 28, 1976, Ser. No. 681,023
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—34



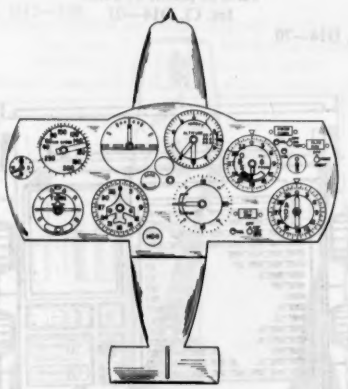
249,044
FOOD SLICER WITH INDEXING TURRET
Samuel J. Popeil, Chicago, Ill., assignor to Popeil Brothers, Inc., Chicago, Ill.
Filed Jul. 9, 1976, Ser. No. 704,079
Term of patent 14 years
Int. Cl. D7—*04;* D15—*08*
U.S. Cl. D15—97



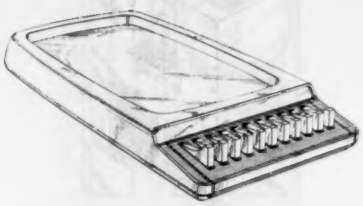
249,045
RECYCLING APPARATUS
John H. Miller, 6412 E. Voltaire Ave., Scottsdale, Ariz. 85254
Filed Dec. 27, 1976, Ser. No. 754,494
Term of patent 14 years
Int. Cl.[2] D25—*03;* D15—*09*
U.S. Cl. D15—123



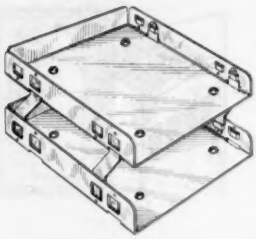
249,046
PORTABLE INSTRUCTIONAL FLIGHT AID DEVICE
William K. Bowman, Jr., Apt. 118, 530 Lee Dr., Coraopolis, Pa. 15108
Filed Jan. 10, 1977, Ser. No. 757,785
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—63



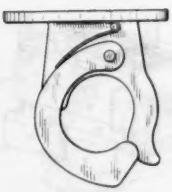
249,047
COMBINED TELEPHONE STAND AND INDEX
Francis Greif, 199 Sussex Gardens, Lancaster Gate, London W.2, England
Filed Jan. 12, 1976, Ser. No. 648,105
Claims priority, application United Kingdom, Jul. 11, 1975, 971807
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



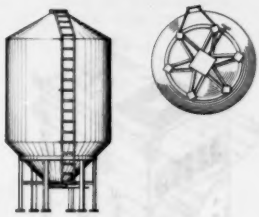
249,048
FILING TRAY
Ronald Drell, and Max I. Epstein, both of Chicago, Ill., assignors to The Vertiflex Company, Chicago, Ill.
Filed Jun. 7, 1976, Ser. No. 693,146
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



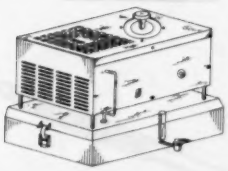
249,049
FISHING ROD SUPPORTING DEVICE
Albert David Black, P.O. Box 3172, Marathon Keys, Fla. 33052
Filed Dec. 10, 1976, Ser. No. 749,465
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13



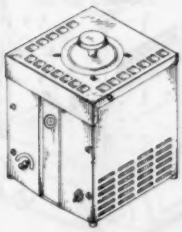
249,050
STORAGE BIN
Elmer Friesen, and Ronald Friesen, both of R.R. #1, Morris, Canada
Filed Mar. 30, 1977, Ser. No. 782,945
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2



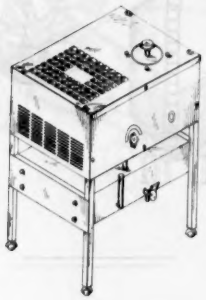
249,051
WATER DISTILLER UNIT
Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,853
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



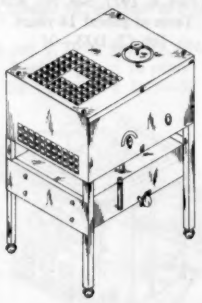
249,052
WATER DISTILLER UNIT
Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,854
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



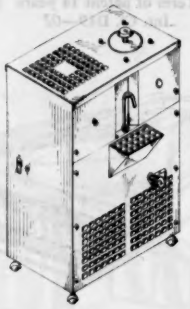
249,053
WATER DISTILLER UNIT
Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,857
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



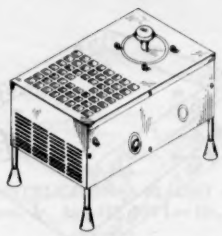
249,054
WATER DISTILLER UNIT
Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,858
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



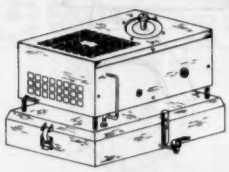
249,055
WATER DISTILLER UNIT
Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,859
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



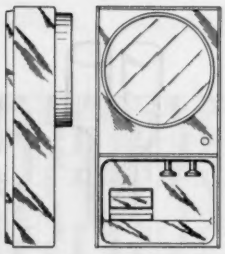
249,056
WATER DISTILLER UNIT
Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 6, 1977, Ser. No. 839,860
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



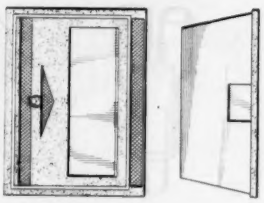
249,057
WATER DISTILLER UNIT
Robert R. Hansrote, 4717 Lowell St., Lincoln, Nebr. 68501
Filed Oct. 17, 1977, Ser. No. 842,637
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



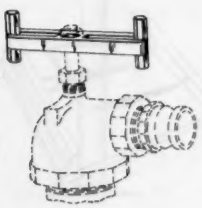
249,058
AFTER BATH DRYER
Arthur Goldstein, 375 Milton Rd., Cambridge, England
Filed Jun. 24, 1976, Ser. No. 699,377
Term of patent 7 years
Int. Cl. D23—*03*
U.S. Cl. D23—74



249,059
FIREPLACE UNIT
Alexander J. Moncrieff-Yeates, 8609 Hillside Pl., Fairfax, Va. 22030
Filed Sep. 28, 1976, Ser. No. 727,514
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



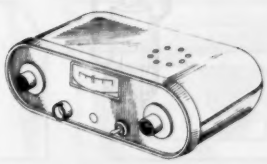
249,060
HYDRANT HANDLE
H. Ronald Ratnik, 222 Weymouth Dr., Rochester, N.Y. 14625
Filed May 25, 1977, Ser. No. 800,292
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



249,061
DRAINABLE BLADE LOUVER HEAD
Joshua R. Dowdell, Jr., 4033 Colgate, Dallas, Tex. 75225, and Paul H. Sanderson, P.O. Box 562, Dallas, Tex. 75065, assignors to Dowco Corporation, Dallas, Tex.
Filed Sep. 13, 1976, Ser. No. 722,620
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—112

249,062
DENTAL INSTRUMENT
Carl-Goran Crafoord, Djursholm, and John Grieves, Stockholm, both of Sweden, assignors to Norabel AB, Nora, Sweden
Filed Sep. 15, 1977, Ser. No. 833,607
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

249,063
BIOFEEDBACK TRAINING MODULE
J. Michael James, Cambridge, Mass., assignor to Cyborg Corporation, Boston, Mass.
Filed Apr. 9, 1976, Ser. No. 675,282
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—17



249,064

PORTABLE DEFIBRILLATOR/EKG MONITOR/EKG RECORDER

David B. Smith, Mercer Island; Douglas J. Hill, Renton; James A. Benson, Bellevue, and Paul W. Jones, Bothell, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

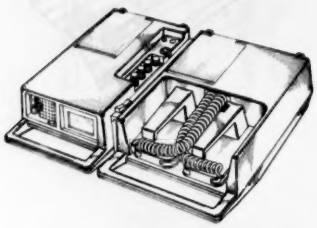
Filed Sep. 3, 1976, Ser. No. 720,117

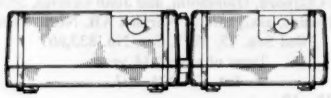
The portion of the term of this patent subsequent to Apr. 26, 1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D24—*01*

U.S. Cl. D24—17





249,065

URINARY DRAINLINE SAMPLING PORT ADAPTER

Herbert F. D'Alo, Oakwood Hills-Cary, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,631

Term of patent 14 years

Int. Cl. D23—*01;* D24—*99*

U.S. Cl. D24—53

249,066

URINARY DRAINLINE SAMPLING PORT ADAPTER

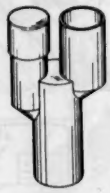
Kenneth E. Pawlak, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,632

Term of patent 14 years

Int. Cl. D23—*01;* D24—*99*

U.S. Cl. D24—53



249,067

URINARY DRAINLINE SAMPLING PORT ADAPTER

Herbert F. D'Alo, Oakwood Hills-Cary; Kenneth E. Pawlak, Mundelein, and Kenneth H. Knox, Libertyville, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,668

Term of patent 14 years

Int. Cl. D23—*01;* D24—*99*

U.S. Cl. D24—53

249,068

INTERLOCKING WALL UNIT

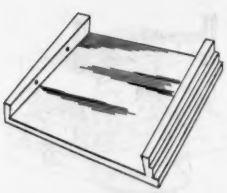
Milton A. Wallace, Bell Haven Park, 3200 NW. 79th St., Apt. 1925, Miami, Fla. 33147

Continuation of Ser. No. 353,464, Apr. 23, 1973, Pat. No. Des. 237,170. This application May 5, 1975, Ser. No. 574,335

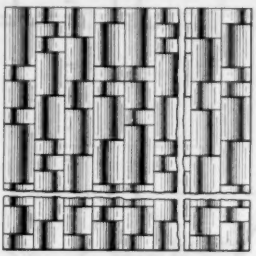
Term of patent 14 years

Int. Cl. D25—*01*

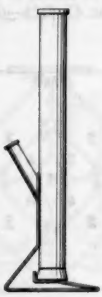
U.S. Cl. D25—58



249,069
DECORATIVE SCREEN FOR FACADES
Michael Polifka, Spotswood, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.
Filed Mar. 19, 1976, Ser. No. 668,601
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—87

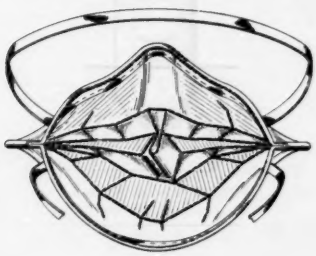


249,070
SMOKING DEVICE
Michael G. Evans, North Hollywood, Calif., assignor to Kevin J. Dawes, North Hollywood, Calif.
Filed Jan. 14, 1977, Ser. No. 759,511
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

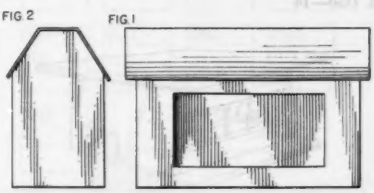


249,071
WATER PIPE
George E. Shepard, Jr., 2919-G Cottage Pl., Greensboro, N.C. 27403
Filed Aug. 15, 1977, Ser. No. 824,868
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—03

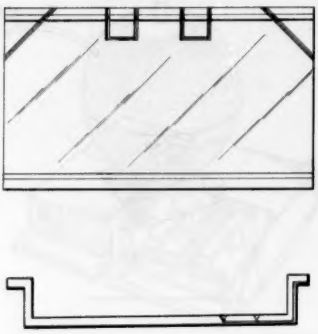
249,072
DISPOSABLE RESPIRATORY MASK
William H. Revoir, Barrington, R.I., assignor to American Optical Corporation, Southbridge, Mass.
Filed Nov. 22, 1976, Ser. No. 743,995
Term of patent 14 years
Int. Cl. 29—*02*; 24—*99*
U.S. Cl. D29—8



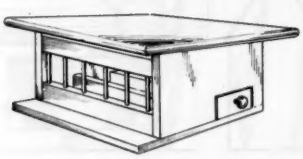
249,073
AQUARIUM COVER
James L. Harden, 13223 S. King Dr., Chicago, Ill. 60627
Filed Jun. 13, 1977, Ser. No. 806,017
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



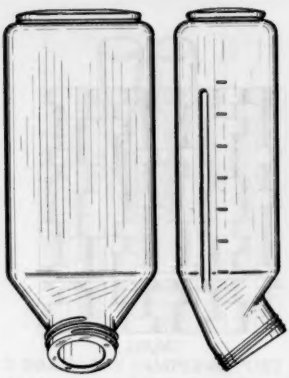
249,074
AQUARIUM COVER
Daniel F. Groth, 14 Brookdale Dr., Wilbraham, Mass. 01095
Filed Aug. 26, 1977, Ser. No. 827,969
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



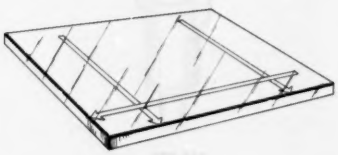
249,075
BIRD FEEDER
Edward Platt, 769 Glenwood Ave. NE., Warren, Ohio 44483
Filed Jul. 8, 1977, Ser. No. 813,821
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



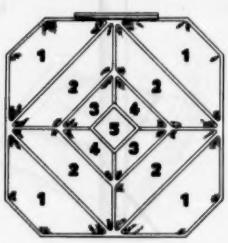
249,076
ANIMAL NURSER
Paul K. Meeker, 412 Park Ave., Kent, Ohio 44240, and Herbert B. Mette, 17246 Greenbrier Dr., Strongsville, Ohio 44136
Filed Aug. 16, 1977, Ser. No. 825,059
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



249,077
GOLF SHOT DIRECTOR
Joseph W. Friskel, 102 N. Linn, Frontenac, Kans. 66762
Filed Nov. 14, 1975, Ser. No. 631,857
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



249,078
GAME TARGET
William D. Gutke, 5257 Shelato Way, Carmichael, Calif. 95608
Filed Dec. 1, 1975, Ser. No. 636,650
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



249,079

GAME STICK FOR THROWING OR CATCHING A RING

Walter W. Soderman, and Clifford H. Harman, II, both of Lansing, Mich., assignors to Globe Industrial Sales Company, Lansing, Mich.

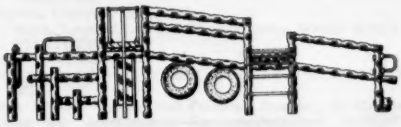
Filed Jun. 14, 1976, Ser. No. 695,797
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BC

249,080

COMBINED PLAYGROUND CLIMBER AND SLIDE

Donald E. West, Crystal, Minn., assignor to Game Time, Inc., Litchfield, Mich.

Filed Jul. 12, 1976, Ser. No. 704,399
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H

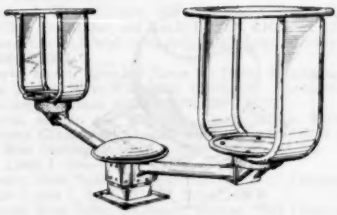


249,081

PLAYGROUND RIDER

Ronald W. Zick, Minneapolis, Minn., assignor to Game Time, Inc., Litchfield, Mich.

Filed Jul. 23, 1976, Ser. No. 708,109
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 C



249,082

GOLF PUTTER HEAD

Richard D. McCreary, 4927 Valerie, Bellaire, Tex. 77401

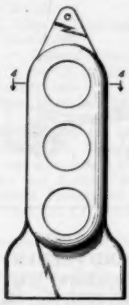
Filed Nov. 26, 1976, Ser. No. 745,372
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

249,083

BALL HOLDER

Roger C. Evans, 10214 Dogwood Ave., Palm Beach Gardens, Fla. 33410

Filed Dec. 1, 1976, Ser. No. 746,594
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

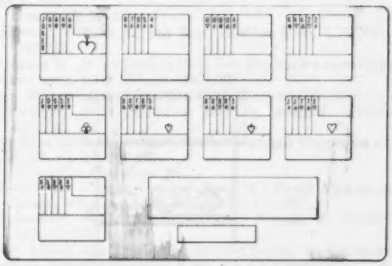


249,084

POKER AID CARD

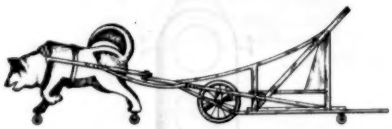
Robert R. Kowalski, 1161 North Lincoln, Casper, Wyo. 82601

Filed Dec. 8, 1975, Ser. No. 638,750
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13 A

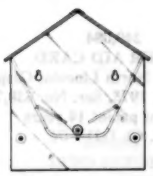


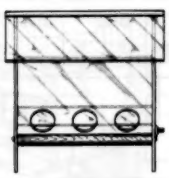
249,085
TOY POT
James L. Damascus, Riverdale, N.Y., assignor to Gabriel Industries, Inc., New York, N.Y.
Filed Jul. 14, 1976, Ser. No. 705,190
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

249,086
TOY DOG AND SLED
John Tancredi, 81 Pergola Ave., Jamesburg, N.J. 08831
Continuation-in-part of Ser. No. 605,768, Aug. 18, 1975. This application Sep. 29, 1977, Ser. No. 837,892
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AN

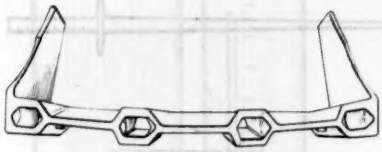


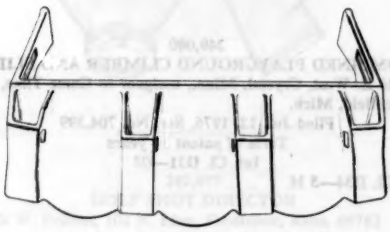
249,087
BIRD FEEDER
Earle G. Simmons, 25 Westchester Way, Warwick, R.I. 02886
Filed Dec. 19, 1977, Ser. No. 862,294
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



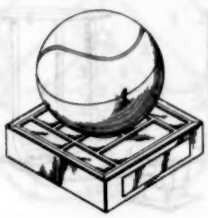


249,088
FRONT LIPS FOR DIGGING BUCKET OR THE LIKE
Sten Johan Dahlberg, Kariskoga, Sweden, assignor to AB Bofors, Bofors, Sweden
Filed Jul. 5, 1974, Ser. No. 486,263
Claims priority, application Sweden, Jan. 7, 1974, 7425
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—32

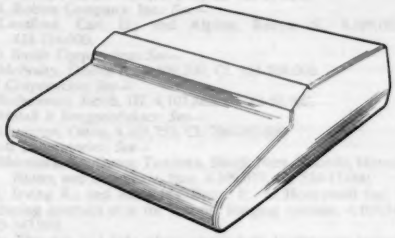




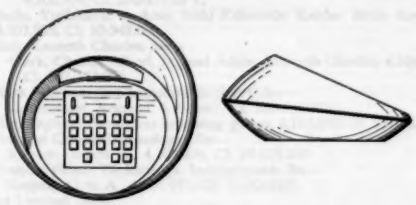
249,089
TENNIS BALL PRINTER
Donald E. Studley, Atlanta, Ga., assignor to Tennis Designs by Studley, Inc., Atlanta, Ga.
Filed Apr. 19, 1976, Ser. No. 677,893
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—10



249,090
CASING FOR AN ELECTRONIC CALCULATOR
Leroy J. LaCelle, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 18, 1976, Ser. No. 667,912
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



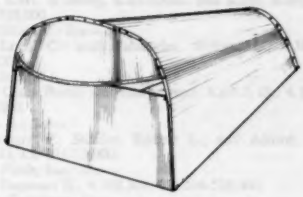
249,091
CONSOLE FOR APPARATUS FOR PERFORMING MATHEMATICAL FUNCTIONS
Eric F. Burtis, 45 Melanie La., Atherton, Calif. 94025
Filed Nov. 29, 1976, Ser. No. 745,641
Term of patent 14 years
Int. Cl. D18—*01;* D14—*02*
U.S. Cl. D64—11 B



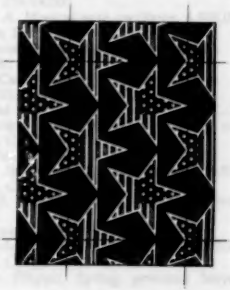
249,092
ELECTRONIC CALCULATING MACHINE
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jul. 25, 1977, Ser. No. 818,821
Claims priority, application Japan, Jan. 26, 1977, 52/2303
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

249,093
ELECTRONIC CALCULATING MACHINE
Shigetoshi Hazama; Matafumi Ikeda; Masafumi Yamagami, and Yoshiaki Kobayashi, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Aug. 23, 1977, Ser. No. 827,176
Claims priority, application Japan, Feb. 23, 1977, 52/6424
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

249,094
TENT
Arthur H. Stewart, Jr., 1904 S. Glendon Dr., Melbourne, Fla. 32901
Filed Sep. 7, 1976, Ser. No. 720,793
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D88—3 B



249,095
TEXTILE FABRIC
Leo Comensoli, Bondi Junction, Australia, assignor to Speedo Knitting Mills Pty Ltd, Australia
Filed Nov. 24, 1975, Ser. No. 634,412
Claims priority, application Australia, May 29, 1975, 67073/75; May 29, 1975, 67074/75
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 FF



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TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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McNulty, Dennis A., 4,109,200, Cl. 324-208.000.

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Brown, Dale Gordon; and Brand, William Wayne, 4,108,904, Cl. 260-600.00R.
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,108,883, Cl. 260-453.0RW.
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,109,072, Cl. 526-258.000.

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Demerson, Christopher A.; and Humber, Leslie G., 4,108,998, Cl. 424-258.000.

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Yindra, Leonard J.; Evans, David F.; and Klug, Joseph R., 4,108,086, Cl. 108-157.000.

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American Solar King Corporation: *See*—
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Bouthors, Pierre Marcel, 4,109,235, Cl. 340-52.00F.

Automobiles Peugeot and Hautrifil: *See*—
Lussier, Michel, 4,107,824, Cl. 24-27.000.

Autonumerics, Inc.: *See*—
Steinberg, Walter A.; and Parker, Howard E., 4,109,187, Cl. 318-572.000.

Autotronic Controls, Corp.: *See*—
Chapin, Leonard Lee; and Merrick, James Walter, 4,108,127, Cl. 123-124.00R.

Avco Corporation: *See*—
Billing, Rudolph W., Jr.; and Conlon, Charles M., Jr., 4,108,074, Cl. 102-92.700.

Avenia, Richard William; and Pecherer, Benjamin, to Hoffmann-La Roche Inc. Immunoassay for catecholamines. 4,108,973, Cl. 424-1.000.

Avery, Carl Fredrick, Jr.: *See*—
Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.

Ayerst, McKenna & Harrison Limited: *See*—
Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,108,997, Cl. 424-256.000.

Azemar, Michel; and Viglecca, Lucien, to Rhone-Poulenc Industries. Horizontal autoclave for the bulk preparation of polymers and copolymers on a basis of vinyl chloride. 4,109,069, Cl. 526-65.000.

B & H Commercial Inventors & Designers Limited: *See*—
Cook, Peter Henry; and Holmes, Joseph Arthur Henry, 4,107,853, Cl. 35-35.00H.

B & H Manufacturing Company, Inc.: *See*—
Hoffmann, Wolfgang, 4,108,709, Cl. 156-446.000.
Hoffmann, Wolfgang, 4,108,710, Cl. 156-450.000.
Hoffmann, Wolfgang, 4,108,711, Cl. 156-497.000.

Babcock Kina Limited: *See*—
Matthews, Paul William, 4,107,816, Cl. 15-320.000.

Babcock & Wilcox Company, The: *See*—
Butti, James Paul, 4,108,408, Cl. 248-68.00R.

Babcock & Wilcox, Limited: *See*—
Joyce, William Inglis, 4,108,554, Cl. 356-156.000.

Babilon, Alfred: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.

Babineaux, Lucien J. Well cable stop for stripping operations. 4,108,245, Cl. 166-301.000.

Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., to Barry-Wehmiller Company. Transparent container inspection apparatus. 4,108,762, Cl. 209-111.70T.

Babunovic, Momir; and Whitlock, Donald E., to Barry-Wehmiller Company. Container washer having external label filter and separator with filter flushing means. 4,108,774, Cl. 210-167.000.

Baccei, Louis J.: *See*—
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,108,883, Cl. 260-453.0RW.
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,109,072, Cl. 526-258.000.

Baelz, Harry C.; and Cassel, Harrison E., to Schulmerich Carillons, Inc. Program control device. 4,109,119, Cl. 200-38.0BA.

Baer, Ralph H.; and Fletchic, Donald K., to Marvin Glass & Associates. Programmable phonograph device. 4,109,114, Cl. 179-100.40D.

Baer, Terry G.; and Klopfenstein, Wayne A., to Caterpillar Tractor Co. Tire and center support assembling apparatus. 4,108,233, Cl. 157-1.370.

Baeyertz, John F.: *See*—
Rostek, Paul M.; and Baeyertz, John F., 4,109,295, Cl. 361-401.000.
Rostek, Paul M.; and Baeyertz, John F., 4,109,296, Cl. 361-401.000.

Baglai, Vitaly Mikhailovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Baika, Toyokazu: *See*—
Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, 4,108,133, Cl. 123-191.00S.

Bailey, John M., to Caterpillar Tractor Co. Fuel injection pump. 4,108,130, Cl. 123-139.0AQ.

Bairakov, Ivan Fedorovich: *See*—
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.

Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, to Imperial Chemical Industries Limited. 2-Aminothiophenes. 4,108,867, Cl. 260-332.20C.

Bajusz, Sandor: *See*—
Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.

Baker, Ann Marie, to Dow Chemical Company, The. Method for making crosslinked resin foams from at least one dicarboxylic acid, at least one ethylenically unsaturated dicarboxylic acid anhydride and a polyisocyanate. 4,108,810, Cl. 521-129.000.

Baker, William H.: *See*—
Sottosanti, Philip C.; Baker, William H.; and Dolling, William T., 4,108,381, Cl. 239-265.350.

Bala, Harry; and Mowli, John C. Heat sealing machine with cooling means. 4,108,712, Cl. 156-498.000.

Balchunas, Charles A., to General Electric Company. Thermostat controlled flatiron. 4,109,136, Cl. 219-252.000.

Balke-Durr Aktiengesellschaft: *See*—
Joekel, Alfred; Langen, Hans; and Denner, Peter, 4,107,832, Cl. 29-157.3AH.

Ball, Raymond L.; Leverone, Paul G.; and Biegler, Warren H., to United States of America, Navy. Three axis magnetometer calibration checking method and apparatus. 4,109,199, Cl. 324-202.000.

Ballman, Albert Anthony; and Robbins, Murray, to Bell Telephone Laboratories, Incorporated. Process for producing lithium niobate and lithium tantalate. 4,108,970, Cl. 423-593.000.

Balmer, Oskar: *See*—
Focke, Heinz; and Balmer, Oskar, 4,108,263, Cl. 177-145.000.

Banks, Arthur James: *See*—
Hopkins, Robert Sherman, Jr.; Banks, Arthur James; and Dischert, Robert Adams, 4,109,276, Cl. 358-4.000.

Bar, Ulrich: *See*—
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,109,155, Cl. 250-505.000.

Baranski, Robert B.: *See*—
Smejkal, Paul V.; and Baranski, Robert B., 4,107,973, Cl. 72-450.000.

Bareis, Alfred; Dangelmaier, Karl; and Braun, Reinhard, to L. Schuler GmbH. Aligning and stamping arrangement. 4,108,320, Cl. 214-8.000.

Barger, J. P.; and Holroyd, Joseph A., to Dynatech Corporation. Blood filming apparatus. 4,108,109, Cl. 118-52.000.

Barnard, Daniel Dewey, to Bendix Corporation, The. Air/fuel ratio for an internal combustion engine controlled by gas sensor in intake manifold. 4,108,122, Cl. 123-119.0EC.

Barnich, Richard G.; and Hakeem, Timothy M., to Process Computer Systems, Inc. Digital processor for generating alphanumeric display on a cathode ray tube. 4,109,244, Cl. 340-324.0AD.

Baron, Richard Alan. Skate board safety accessory. 4,108,452, Cl. 280-11.300.

Barr, Graham S. S.: *See*—
Hanson, William A.; and Barr, Graham S. S., 4,108,602, Cl. 23-230.00R.

Barr, James W., Jr., to Sterling Drug Inc. Process for removing calcium oxalate scale. 4,108,680, Cl. 134-3.000.

Barrall, Jeffery L., to Armstrong Cork Company. Method for treating lightweight, non-cementitious building material. 4,109,032, Cl. 427-255.000.

Barre, Rene Emile Leon. Device for watertight stoppering of bottles. 4,108,325, Cl. 215-364.000.

Barry-Wehmiller Company: *See*—
Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., 4,108,762, Cl. 209-111.70T.
Babunovic, Momir; and Whitlock, Donald E., 4,108,774, Cl. 210-167.000.

Barson, Leslie; and Davis, Frederick Charles, to Companion Pty. Limited. Portable barbeque. 4,108,142, Cl. 126-41.00R.

Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,109,083, Cl. 544-26.000.
Barth, Wayne E., to Pfizer Inc. 7-Amino-3-substituted-cephem compounds. 4,109,085, Cl. 544-30.000.
Bartley, Thomas S.; and Rosenblath, Quinlan T., Jr., to International Paper Company. Apparatus and method for the indirect measurement and control of the flow rate of a liquid in a piping system. 4,108,574, Cl. 417-19.000.
Barton, Paul, to International Telephone and Telegraph Corporation. Scanning beam receiver. 4,109,249, Cl. 343-108.00M.
BASF Aktiengesellschaft: *See—*
Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.
Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.
BASF Wyandotte Corporation: *See—*
Narayan, Thirumurti; and Cenker, Moses, 4,108,808, Cl. 521-181.000.
Narayan, Thirumurti; and Cenker, Moses, 4,108,809, Cl. 521-136.000.
Bateman, Coates F.; and Soltanoff, Louis, to Veeder Industries, Inc. Fluid meter. 4,107,992, Cl. 73-260.000.
Bates, Albert M.; Sandford, Wayne H., Jr.; and Madera, Anthony J., to United States of America, Navy. Correction and transmission system for directional target information. 4,109,232, Cl. 340-6.00R.
Bates, Homer J.: *See—*
Carstens, Marion R.; and Bates, Homer J., 4,108,079, Cl. 104-252.000.
Bates, Paul Edward; Hughes, John Ronald; and Zoueshtiagh, Nahid, to Procter & Gamble Company, The. Preparation of French fries. 4,109,012, Cl. 426-302.000.
Battelle-Institut e.V.: *See—*
Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, 4,108,620, Cl. 55-210.000.
Battelle-Institute: *See—*
Ehrhardt, Josef; and Winter, Heinrich, 4,108,737, Cl. 204-13.000.
Bauer, Adeline L. Stuffed reversible doll. 4,107,873, Cl. 46-153.000.
Bauer, Hans, to Dietz-metall GmbH & Co. KG. Grilling apparatus. 4,108,141, Cl. 126-41.00R.
Bauer, Richard G.: *See—*
Mast, William C.; Bauer, Richard G.; and Wathen, Tom M., 4,108,923, Cl. 260-836.000.
Bauer, Werner R.; and Smith, William N., to Robertshaw Controls Company. Electrical switch construction and method of making the same. 4,109,121, Cl. 200-67.00E.
Baus, Heinz Georg. Lateral connection member of a partition for a bathing- or shower-cabin. 4,107,878, Cl. 49-125.000.
Baxter Travenol Laboratories, Inc.: *See—*
Brown, Richard I., 4,108,353, Cl. 233-26.000.
Pearson, Bert David; and Kissane, Richard J., 4,108,607, Cl. 23-253.00R.
Bayer Aktiengesellschaft: *See—*
Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, 4,108,842, Cl. 528-61.000.
Reiff, Helmut; Wenzel, Wolfgang; Grammel, Jurgen; and Dieterich, Dieter, 4,108,814, Cl. 260-29.2TN.
Reinehr, Ulrich; Nogaj, Alfred; and Lorenz, Gunter, 4,108,845, Cl. 526-240.000.
Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,108,936, Cl. 264-78.000.
BBC Brown, Boveri & Company Limited: *See—*
Melton, Keith Nelson; and Sebalj, Renata, 4,109,125, Cl. 200-268.000.
Beale, Harry A.; Strangman, Thomas E.; and Taylor, Edward W., to United Technologies Corporation. Method for altering the composition and structure of aluminum bearing overlay alloy coatings during deposition from metallic vapor. 4,109,061, Cl. 428-678.000.
Beavers, Allan E.: *See—*
Pelsue, Bradley A.; and Beavers, Allan E., 4,108,143, Cl. 126-110.00B.
Becher, Wilfried: *See—*
Massonne, Joachim; and Becher, Wilfried, 4,108,967, Cl. 423-469.000.
Beckerman, Joseph W.: *See—*
Elfes, Lee E.; and Beckerman, Joseph W., 4,107,951, Cl. 64-14.000.
Becton, Dickinson and Company: *See—*
Hales, Richard Harold, 4,108,975, Cl. 424-1.000.
Reese, Max G., 4,108,976, Cl. 424-1.000.
Becwar, Andrew J.: *See—*
Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J., 4,107,940, Cl. 62-121.000.
Beecham Group Limited: *See—*
Pearson, Michael John; and Branch, Clive Leslie, 4,108,992, Cl. 424-248.530.
Beecham Inc.: *See—*
Mazzanobile, Salvatore; and Hillermeier, Robert John, 4,108,978, Cl. 424-49.000.
Begis, Roger: *See—*
Lambert, Gerard Edouard; and Begis, Roger, 4,108,068, Cl. 101-363.000.
Bein, Kenneth E. Apparatus for controlling feed mechanisms of grinding and cutting apparatus. 4,107,883, Cl. 51-165.800.
Beismann, Walter; Lampe, Hans Hermann; and Pohle, Werner, to International Business Machines Corporation. Method of error analysis and diagnosis in electronic data processing systems. 4,108,360, Cl. 235-304.000.
Beitner, Shlomo, to Bipol Ltd. Portable refrigerator unit. 4,107,934, Cl. 62-3.000.
Belenkov, Nikolai Mikhailovich; Kurnosov, Anatoly Ivanovich; and Malitsky, Evgeny Efremovich. Semiconductor switching device with breakdown diode formed in the bottom of a recess. 4,109,274, Cl. 357-38.000.
Bell, Charles W.: *See—*
Kling, David A.; and Bell, Charles W., 4,109,095, Cl. 174-67.000.
Bell, David: *See—*
Gregg, Michael John William; and Bell, David, 4,108,011, Cl. 74-229.000.
Bell & Howell Company: *See—*
Watson, Charles J.; and Hrastnik, Walter, 4,108,537, Cl. 350-150.000.
Bell, Roscoe Lee: *See—*
Anderson, George J.; and Bell, Roscoe Lee, 4,108,448, Cl. 277-157.000.
Bell Telephone Laboratories, Incorporated: *See—*
Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, 4,109,113, Cl. 179-99.000.
Ballman, Albert Anthony; and Robbins, Murray, 4,108,970, Cl. 423-593.000.
Bindell, Jeffrey Bruce; Labuda, Edward Franklin; and Moller, William Michael, 4,107,835, Cl. 29-590.000.
Brackett, Charles Arthur; and Smith, Richard Grant, 4,109,217, Cl. 331-94.50S.
Chu, Ta-Shing, 4,109,253, Cl. 343-756.000.
Donnell, John Robinson; Heiter, George Ludwig; and Miedema, Hotze, 4,109,212, Cl. 328-163.000.
Favale, Anthony George, 4,108,522, Cl. 339-19.000.
Lesh, Nathan George, deceased; Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,109,297, Cl. 361-402.000.
Miller, Norman Richards, 4,109,194, Cl. 323-17.000.
Pritchard, Assunta Anna; and Wagner, Sigurd, 4,108,716, Cl. 156-636.000.
Yi Cho, Alfred; and Schneider, Martin Victor, 4,108,738, Cl. 204-15.000.
Bellem, Norman A., to Butler Manufacturing Company. Wall panel unit. 4,107,892, Cl. 52-403.000.
Beloit Corporation: *See—*
Berry, Kenneth William, 4,108,110, Cl. 118-412.000.
Bembenek, William E., to Frito-Lay, Inc. Rotary cutting device for forming strips of shaped article preforms. 4,108,033, Cl. 83-122.000.
Bendix Corporation, The: *See—*
Barnard, Daniel Dewey, 4,108,122, Cl. 123-119.0EC.
Niemaszyk, Casimer; and Rothenberg, Peter, 4,108,358, Cl. 235-302.000.
Bengtson, Robert W., to Foster Wheeler Energy Corporation. Scheduling tool. 4,108,356, Cl. 235-69.000.
Bennett, Derek J., to Bunker Ramo Corporation. Wave motion isolator between buoy and cable-suspended instrumentation package. 4,107,804, Cl. 9-8.00R.
Bennett, Thomas M.: *See—*
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.
Benson, James M., to Teledyne, Inc. Resistance bridge-type flowmeter. 4,107,991, Cl. 73-204.000.
Bentsen, Thomas Valdemar, to Bruun & Sorensen A/S. Garbage suction plant. 4,108,498, Cl. 302-27.000.
Bentz, Francis: *See—*
Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,108,936, Cl. 264-78.000.
Berenson, Sidney G., to NCR Corporation. Overload protection system. 4,109,288, Cl. 361-58.000.
Berg, Peter G.: *See—*
Marcoux, Leo; and Berg, Peter G., 4,108,125, Cl. 123-122.00F.
Berger, Eugene; and Bienfait, Charles, to Solvay & Cie. Process for the polymerization of olefins. 4,109,071, Cl. 526-114.000.
Bernat, Jean-Pierre; and Sors, Jean, to Societe Nationale Elf Aquitaine. Recovery of the zinc contained in the residual solutions obtained after electrolytic deposition. 4,108,744, Cl. 204-119.000.
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, to American Cyanamid Company. Nitro or amino phenylenebis(carbonylimino)dinaphthalenetrisulfonic compounds as complement inhibitors. 4,108,890, Cl. 260-507.00R.
Berry, Henry K. Quick-closing fire gate. 4,108,195, Cl. 137-68.00A.
Berry, Kenneth William, to Beloit Corporation. Apparatus for coating both sides of a travelling web. 4,108,110, Cl. 118-412.000.
Berry, Richard C., to Crouse-Hinds Company. Expansion-deflection coupling. 4,109,097, Cl. 174-86.000.
Bertolini Engineering Co., Inc.: *See—*
Bertolini, William A., 4,108,326, Cl. 220-1.500.
Bertolini, William A., to Bertolini Engineering Co., Inc. Adapter frames to extend length of intermodal containers. 4,108,326, Cl. 220-1.500.
Bertolino, Giorgio Maria: *See—*
Bifani, Alberto Giovanni; and Bertolino, Giorgio Maria, 4,108,317, Cl. 214-1.0PA.
Bertone, Antonino: *See—*
Sarti, Vincenzo; Bertone, Antonino; and Rivetti, Enrico, 4,108,273, Cl. 180-148.000.
Besenfelder, Edward Roald; Cantrell, Steve Garner; and Cobeen, Charles Peter, to Honeywell Information Systems Inc. Apparatus for

digital data recovery from mass storage devices. 4,109,236, Cl. 340-146.10F.

Bethlehem Steel Corporation: *See*—
Burcaw, Kenneth R., Jr; Kwasnoski, Daniel; and Rudzki, Eugene M., 4,108,735, Cl. 203-7.000.
Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., 4,108,734, Cl. 203-7.000.

Better Built Machinery Corporation: *See*—
Wolff, Robert, 4,108,601, Cl. 21-96.000.

Betush, Frank A., to Progessive Machine Products, Inc. Pinch valve syringe. 4,108,178, Cl. 128-224.000.

Beutel, Rudolf, to Carl Schenk AG, Firma. Method and apparatus for measuring and indicating the unbalance of a rotor. 4,109,312, Cl. 364-508.000.

Bezsilko, Nicolas, to S. A. Vandeputte & Cie. Automatic sorter for pieces of money or similar objects as a function of their diameter. 4,108,187, Cl. 133-3.00A.

Bi, Le-Khac: *See*—
Fetters, Lewis J.; and Bi, Le-Khac, 4,108,945, Cl. 260-880.00B.

Bicht, John Richard: *See*—
Warner, Peter Stuart; and Bicht, John Richard, 4,109,064, Cl. 429-66.000.

Biddlecom, William Gerard: *See*—
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,108,892, Cl. 260-514.00D.

Biegler, Warren H.: *See*—
Ball, Raymond L.; Leverone, Paul G.; and Biegler, Warren H., 4,109,199, Cl. 324-202.000.

Bienfait, Charles: *See*—
Berger, Eugene; and Bienfait, Charles, 4,109,071, Cl. 526-114.000.

Bifani, Alberto Giovanni; and Bertolino, Giorgio Maria, to Fiat-Allis Macchine Movimento Terra S.p.A. Continuous laying of pipes of large diameter. 4,108,317, Cl. 214-1.0PA.

Biller, Bruce A.; and Scherer, Henry W., to S&C Electric Company. Contact assembly for high voltage fuse. 4,109,227, Cl. 337-252.000.

Billing, Rudolph W., Jr.; and Conlon, Charles M., Jr., to Avco Corporation. Frangible target practice projectile. 4,108,074, Cl. 102-92.700.

Billings Energy Corporation: *See*—
Billings, Roger E., 4,108,605, Cl. 23-252.00R.

Billings, Roger E., to Billings Energy Corporation. Hydrogen purification and storage system. 4,108,605, Cl. 23-252.00R.

Bilow, Norman, to Hughes Aircraft Company. Process for synthesizing acetylene-substituted polyimides and polyimides thereof. 4,108,836, Cl. 528-128.000.

Bindell, Jeffrey Bruce; Labuda, Edward Franklin; and Moller, William Michael, to Bell Telephone Laboratories, Incorporated. Fabrication of semiconductive devices. 4,107,835, Cl. 29-590.000.

Binder, Horst: *See*—
Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, 4,108,620, Cl. 55-210.000.

Binge, Derek Sidney: *See*—
Cable, Walter Lester; Binge, Derek Sidney; and Korosec, Rudolph Francis, 4,108,407, Cl. 248-23.000.

Bio-Rad Laboratories, Inc.: *See*—
Wegfahrt, Paul F.; Lewin, Nathan; and Monthony, James F., 4,108,974, Cl. 424-1.000.

Bipol Ltd.: *See*—
Beitner, Shlomo, 4,107,934, Cl. 62-3.000.

Birum, Gail H., to Monsanto Company. 6-Hydroxy (alkoxy) phenylthiomethylene di(organophosphorus) compounds and process for making same. 4,108,949, Cl. 260-932.000.

Bismarck, Otto Herbert, to RCA Corporation. Pulse staggering circuit. 4,109,209, Cl. 328-60.000.

Bitton, Georges, to Rexroth-Sigma. Casing for gear pump or motor. 4,108,582, Cl. 418-132.000.

Black, Allan Lindsay: *See*—
Fukuto, Tetsuo Roy; and Black, Allan Lindsay, 4,108,991, Cl. 424-248.500.

Black, Dennis A.: *See*—
Brucken, Byron L.; and Black, Dennis A., 4,108,577, Cl. 417-222.000.

Black, William M.; and McCallum, R. Bruce. Muffler. 4,108,275, Cl. 181-252.000.

Blankenhorn, Paul R.; Cady, Philip D.; Kline, Donald E.; and Weyers, Richard E. Process for impregnating concrete with polymers. 4,109,033, Cl. 427-314.000.

Blanz, Roland, to Graubremse GmbH. Arrangement for locking a freight container to a base, particularly a trailer or wheel frame. 4,108,081, Cl. 105-366.00B.

Blau, Harry. Music teaching machine. 4,108,042, Cl. 84-471.00R.

Blitchington, Frank Henning; and Hudson, George David, to Western Electric Company, Inc. Apparatus for positioning a pair of elements into aligned intimate contact. 4,109,158, Cl. 250-548.000.

Block, Thomas S., to Clarke-Gravely Corporation. Actuator for self-propelled sweeper. 4,108,268, Cl. 180-74.000.

Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, to International Business Machines Corporation. Instruction execution modification mechanism for time slice controlled data processors. 4,109,311, Cl. 364-200.000.

Boast, Warren Benefield, to Iowa State University Research Foundation, Inc. Method and apparatus for frequency compensation of electro-acoustical transducer and its environment. 4,109,107, Cl. 179-1.00D.

BOC Limited: *See*—
Leigh, Roland Albert, 4,108,960, Cl. 423-265.000.

Bodenseewerk Perkin-Elmer & Co., Gmbh: *See*—
Rodel, Gunther Georg, 4,109,308, Cl. 363-125.000.

Boehnlein, James E., to PMC Industries, Inc. Profiler. 4,107,848, Cl. 33-174.00P.

Boeing Company, The: *See*—
Horne, William E., 4,108,704, Cl. 156-272.000.
James, Varnell L., 4,108,455, Cl. 280-43.230.

Boersma, Rintje; and Irik, Gijsbert Waldemar, to Coq B.V. Circuit-breakers for high voltages. 4,109,124, Cl. 200-148.00B.

Bogar, Earl M., Jr. Vehicle mounted gun rack with mounting brackets. 4,108,313, Cl. 211-64.000.

Bohm, Georg Gustav Anton; Trivedi, Prakash Druman; and Valaitis, Joseph Kestutis, to Firestone Tire & Rubber Company, The. Irradiation process for the preparation of poly(vinyl chloride-g-isobutylene) copolymers. 4,108,749, Cl. 204-159.170.

Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, to Battelle-Institut e.V. Device for the separation of gaseous mixtures into components of different molecular mass. 4,108,620, Cl. 55-210.000.

Boise Cascade Corporation: *See*—
Pfaffendorf, James L., 4,108,349, Cl. 229-15.000.

Bolis, Edoardo, to ITT Industries, Incorporated. Electrified channel, equipped with a snap-acting connector. 4,108,523, Cl. 339-22.00B.

Bollinger, Frederic G.; and D'Amico, John J., to Monsanto Company. N-(substituted phenyl) derivatives of saccharin. 4,108,627, Cl. 71-91.000.

Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., to Monsanto Company. Use of phthalanilic acids to regulate the growth of corn plants. 4,108,632, Cl. 71-115.000.

Bolt Associates, Inc.: *See*—
Chelminski, Stephen V., 4,108,271, Cl. 181-119.000.

Bolton, Theodore S.; and High, Charles N., to Carrier Corporation. Apparatus for reducing exterior condensation in an air conditioner. 4,107,939, Cl. 62-89.000.

Bolyos, Maria: *See*—
Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.

Bonafous, Maurice, to Applications Mechaniques et Robinetterie Industrielle. Isolating valves. 4,108,199, Cl. 137-312.000.

Bond, Robert, to Dunlop Limited. Tire studs. 4,108,230, Cl. 152-210.000.

Bonfield, Joseph: *See*—
Coen, Manus; and Bonfield, Joseph, 4,108,473, Cl. 281-29.000.

Bonne, Claude; Perronnet, Jacques; and Teche, Andre, to Roussel Uclaf. 3-Oxo-5,6-dihydro-1,2,4-oxadiazines useful as antiandrogenic agents. 4,108,993, Cl. 424-248.570.

Bonner, Cletus D., to Strayer Coin Bag Company, Inc. Mailing bag with address card mounting pocket. 4,108,227, Cl. 150-15.000.

Bordine, Darrell E. Greenhouse equipment. 4,107,875, Cl. 47-62.000.

Borg-Warner Corporation: *See*—
Fisher, Walter, 4,108,290, Cl. 192-3.300.
Warner, John Craig; and Gravel, Mark William, 4,108,012, Cl. 74-231.00C.

Bornstein, L. F., to Georgia-Pacific Corporation. Veneer production. 4,108,226, Cl. 144-327.000.

Borsi, Jozsef: *See*—
Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.

Borunda, Gabriel S.: *See*—
Groutage, Frederick D.; and Borunda, Gabriel S., 4,108,400, Cl. 244-3.150.

Borzym, Alexander, to Alpha Industries, Inc. Cut-off die set. 4,108,029, Cl. 83-54.000.

Bouchoux, Jean W.; and Larkin, William A., to M&T Chemicals Inc. Polylactam composition containing hexaorgano distannane. 4,108,828, Cl. 260-45.75H.

Bougon, Pierre Paul Andre, to Le Materiel Telephonique. Training system for simulating an animated scene. 4,107,854, Cl. 35-25.000.

Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., to L'Oreal. Greaseless cosmetic article for applying make-up to the eyelids. 4,108,185, Cl. 401-88.000.

Bourque, Rene, to Garcia Corporation, The. Fast closing athletic boot. 4,107,856, Cl. 36-115.000.

Bouthors, Pierre Marcel, to Regie Nationale des Usines Renault; and Automobile Peugeot. Electronic-display instrument panels for automotive vehicles. 4,109,235, Cl. 340-52.00F.

Bowden, Roy Dennis; and Seaton, Thomas, to Imperial Chemical Industries Limited. Chlorination process for producing 2,3,5-trichloropyridine. 4,108,856, Cl. 260-290.0HL.

Bowen, Arthur D., to Bowen, Eleanor J., a part interest. Aircraft emergency letdown system. 4,108,402, Cl. 244-139.000.

Bowen, Eleanor J.: *See*—
Bowen, Arthur D., 4,108,402, Cl. 244-139.000.

Bowen, Mildred Choi: *See*—
Austin, Terry Marshall; Carroll, Eugene Thomas; and Bowen, Mildred Choi, 4,108,552, Cl. 356-87.000.

Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., to BRS, Inc. Athletic shoe having laterally elongated metatarsal cleat. 4,107,858, Cl. 36-134.000.

Bowling, Teamus; and Thomson, Benjamin M., to General Electric Company. Disconnect switch with reset mechanism. 4,109,226, Cl. 337-130.000.

Bowman, Robert W.: *See—*
Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,109,222, Cl. 335-301.000.
Bowser, Robert E., to Simplimatic Engineering Co. Palletizer with tier sheet inserter and banding means. 4,108,061, Cl. 100-7.000.
Bozarth, Rex O., to Hughes Tool Company. Rock bit with specially shaped inserts. 4,108,260, Cl. 175-374.000.
Bozzini, Charles, to ASEA Aktiebolag. Impregnated condenser construction for electric power transmission. 4,109,291, Cl. 361-272.000.
Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, to Commissariat a l'Energie Atomique. Variable-fluence neutron source. 4,109,153, Cl. 250-499.000.
Brackett, Charles Arthur; and Smith, Richard Grant, to Bell Telephone Laboratories, Incorporated. Stabilization circuit for junction lasers. 4,109,217, Cl. 331-94.50S.
Brady, Stephen F.: *See—*
Veber, Daniel F.; Brady, Stephen F.; and Varga, Sandor L., 4,108,987, Cl. 424-177.000.
Brakebill, Harold G., to Robertshaw Controls Company. Condition response differential vacuum regulator and method of making the same. 4,108,197, Cl. 137-81.000.
Brakebill, Harold G., to Robertshaw Controls Company. Engine control system and a differential vacuum regulator therefor or the like. 4,108,372, Cl. 236-86.000.
Branch, Clive Leslie: *See—*
Pearson, Michael John; and Branch, Clive Leslie, 4,108,992, Cl. 424-248.530.
Brand, William Wayne: *See—*
Brown, Dale Gordon; and Brand, William Wayne, 4,108,904, Cl. 260-600.00R.
Brandenburg, Gary M.: *See—*
West, Ernest James; and Brandenburg, Gary M., 4,108,420, Cl. 251-129.000.
Brandenburg, John T.: *See—*
Estes, John H.; Kravitz, Stanley; and Brandenburg, John T., 4,108,218, Cl. 141-1.000.
Brandenstein, Manfred: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,503, Cl. 308-6.00C.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,504, Cl. 308-6.00C.
Brandon, Paul W.: *See—*
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,108,932, Cl. 264-37.000.
Brands, Jacobus; and Thaddey, Kurt, to Prontophot Holding AG. Labelling machine. 4,108,706, Cl. 156-384.000.
Brandt, J. Wayne, to Spectroderm International. Agitator for laboratory tubes and flasks and the like. 4,109,319, Cl. 366-219.000.
Bratton, Robert L.: *See—*
Royer, George Ronald, 4,108,434, Cl. 273-30.000.
Braun AG.: *See—*
Leistner, Rudolf, 4,108,543, Cl. 352-121.000.
Braun, Ernst; and Braun, Gert, to Halbach & Braun. Progressive timbering device. 4,107,931, Cl. 61-45.00D.
Braun, Gert: *See—*
Braun, Ernst; and Braun, Gert, 4,107,931, Cl. 61-45.00D.
Braun, Reinhard: *See—*
Bareis, Alfred; Dangelmaier, Karl; and Braun, Reinhard, 4,108,320, Cl. 214-8.000.
Brawand, Franklin M. Tag line and butt hook constructions. 4,107,825, Cl. 24-115.00R.
Breitenstein, Charles Thomas, to Spiral Step Tool Company. Drill pre-pointing machine. 4,107,882, Cl. 51-118.000.
Bright, Robert G.: *See—*
Andrzejewski, Heinz; Kruschwitz, Werner; and Bright, Robert G., 4,107,898, Cl. 52-716.000.
Briska, Marian; and Eisenbraun, Ewald, to International Business Machines Corporation. Method for thermally oxidizing silicon. 4,109,030, Cl. 427-93.000.
Bristol-Myers Company: *See—*
Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, 4,108,725, Cl. 195-96.000.
British Steel Corporation: *See—*
Engledow, David, 4,108,633, Cl. 75-11.000.
Bronner, Emanuel H., to All One God Faith, Inc. Contraceptive containing device. 4,108,309, Cl. 206-528.000.
Brookshire, Phillip L., to Clopay Corporation. Roman shade and method for making same. 4,108,698, Cl. 156-60.000.
Broverman, Irwin, to Kaiser Aluminum & Chemical Corporation. Cast aluminum plate and method therefor. 4,108,688, Cl. 148-3.000.
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich. Machine for semicontinuous casting of metals. 4,108,237, Cl. 164-425.000.
Brown, Cicero C., deceased (by Brown, Joe R., executor), to Brown Oil Tools, Inc. Check valve assembly. 4,108,203, Cl. 137-496.000.
Brown, Dale Gordon; and Brand, William Wayne, to American Cyanamid Company. Process for the preparation of m-phenoxybenzaldehyde. 4,108,904, Cl. 260-600.00R.
Brown, Donald A.; LaLonde, Paul D.; and Koski, Gerald L., to Donn Products, Inc. Locking connection for suspension ceiling systems. 4,108,563, Cl. 403-347.000.
Brown, Donald W. Sign opening, closing and locking device. 4,107,864, Cl. 40-601.000.
Brown, Edward A.; and Colton, Frank B., to G. D. Searle & Co. 3β,17-Dihydroxy-5α,17α-pregn-20-ene-21-carboxylic acid γ-lactone and esters thereof. 4,108,851, Cl. 260-239.570.
Brown, George L.; and Chen, Albert C., to Mobil Oil Corporation. Cross-linkable emulsifying agents and aqueous emulsions containing the same. 4,108,816, Cl. 260-29.40R.
Brown, Joe R., executor: *See—*
Brown, Cicero C., deceased, 4,108,203, Cl. 137-496.000.
Brown Oil Tools, Inc.: *See—*
Brown, Cicero C., deceased, 4,108,203, Cl. 137-496.000.
Brown, Richard. Device for greasing muzzle-loading bullets. 4,108,044, Cl. 86-19.000.
Brown, Richard I., to Baxter Travenol Laboratories, Inc. Centrifugal apparatus with oppositely positioned rotational support means. 4,108,353, Cl. 233-26.000.
Brown, Roger Alan. Process for making a batt of modified basis weight profile and lengthwise uniformity. 4,107,822, Cl. 19-163.000.
BRS, Inc.: *See—*
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,107,858, Cl. 36-134.000.
Brucken, Byron L.; and Black, Dennis A., to General Motors Corporation. Variable displacement compressor. 4,108,577, Cl. 417-222.000.
Brueninghaus Hydraulik GmbH: *See—*
Gauss, Wilhelm; Van Logten, Henrious; and Kruger, Arthur, 4,108,048, Cl. 91-6.500.
Bruun & Sorensen A/S: *See—*
Bentsen, Thomas Valdemar, 4,108,498, Cl. 302-27.000.
Bryant, Charles Peterson, to Lubrizol Corporation, The. Hydroxyalkyl hydroxy-aromatic condensation products as fuel and lubricant additives. 4,108,784, Cl. 252-56.00R.
Bryson, Jay G.: *See—*
Wideman, Lawson G.; and Bryson, Jay G., 4,108,911, Cl. 260-666.00A.
Bub, Oskar, to Knoll AG. Process for preparing 1,5-benzodiazepine-2-ones. 4,108,852, Cl. 260-239.30B.
Buccellato, Joseph L.: *See—*
Hern, John F.; and Buccellato, Joseph L., 4,108,483, Cl. 292-272.000.
Buchanan, John Paul: *See—*
Froyd, Stanley G.; Ue, Raymond C.; and Buchanan, John Paul, 4,109,185, Cl. 318-571.000.
Buckler, Robert Thomas; and Kurchacova, Elva, to Miles Laboratories, Inc. Aryl-substituted triazolyl propionic acids. 4,109,001, Cl. 424-269.000.
Budde, Karl: *See—*
MacAfee, James Edwin; Winkler, John W.; and Budde, Karl, 4,108,021, Cl. 74-606.00R.
Budrys, Ignas; and Right, Robert W., to General Signal Corporation. Alarm system with repeat of alarm interrupted for priority alarm. 4,109,246, Cl. 340-518.000.
Budzich, Tadeusz. Load responsive valve assemblies. 4,107,923, Cl. 60-427.000.
Buendia, Jean; and Schalbar, Jeanine, to Roussel Uclaf. Analgesic, relaxant, and anti-inflammatory cyclopentanol derivatives. 4,109,009, Cl. 424-283.000.
Bulboaca, Mihai A.: *See—*
Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., 4,108,762, Cl. 209-111.70T.
Bunch, Robert E. Tool for flaring plastic pipe. 4,108,589, Cl. 425-393.000.
Bunker Ramo Corporation: *See—*
Bennett, Derek J., 4,107,804, Cl. 9-8.00R.
Bunn, George Edward: *See—*
Andrew, Gordon Edward; and Bunn, George Edward, 4,107,918, Cl. 60-39.710.
Burba, Peter: *See—*
Lieser, Karl Heinrich; and Burba, Peter, 4,109,080, Cl. 536-43.000.
Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., to Hughes Aircraft Company. Low power reactive drive circuit for capacitive loads. 4,109,192, Cl. 320-1.000.
Burcaw, Kenneth R., Jr; Kwasnoski, Daniel; and Rudzki, Eugene M., to Bethlehem Steel Corporation. Method for improved distillation of ammonia from weak ammonia liquor. 4,108,735, Cl. 203-7.000.
Burcaw, Kenneth R., Jr.: *See—*
Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., 4,108,734, Cl. 203-7.000.
Burck, Joseph M.: *See—*
Tucker, James E.; Burck, Joseph M.; and Morrison, Howard J., 4,107,872, Cl. 46-103.000.
Burden, Roy B., Jr., to Met-Pro Systems, Inc. Rotary incinerator. 4,108,088, Cl. 110-246.000.
Bureau de Recherches Geologiques et Minieres: *See—*
Hermelin, Roger R., 4,108,549, Cl. 355-77.000.
Burgyan, Stephan J., to Ferro Corporation. Composites of glass-ceramic-to-metal, seals and method of making same. 4,109,054, Cl. 428-433.000.
Burri, Kaspar F.; Kienzle, Frank; and Rosen, Perry, to Hoffmann-La Roche Inc. 3,6-Dihydro-2H-1,2-oxazines. 4,109,086, Cl. 544-63.000.
Burroughs Corporation: *See—*
Ogle, James A.; and Lee, James Y., 4,109,180, Cl. 315-169.0TV.
Wicher, Daniel P., Jr., 4,108,521, Cl. 316-17.000.
Burwell, Clifton J.: *See—*
Sturman, Oded E.; and Grill, Benjamin, 4,108,419, Cl. 251-30.000.
Buschhoff, Max: *See—*
Plum, Hans; Buschhoff, Max; and Cejka, Alena, 4,108,990, Cl. 424-245.000.

Busseman, Adolph: *See*—
Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., 4,108,679, Cl. 106-307.000.

Butler Manufacturing Company: *See*—
Bellem, Norman A., 4,107,892, Cl. 52-403.000.

Butler, Neal R.: *See*—
Rickey, Frank A., Jr.; Simms, Paul C.; and Butler, Neal R., 4,108,718, Cl. 159-30.000.

Butoi, Aristotel. Automatic welding mask shutter lens system. 4,109,132, Cl. 219-147.000.

Butti, James Paul, to Babcock & Wilcox Company, The. Looped tube clamp support. 4,108,408, Cl. 248-68.00R.

Buxbaum, Lothar, to Ciba-Geigy Corporation. Thermoplastic polyesters. 4,108,834, Cl. 528-289.000.

Buxbaum, Lothar: *See*—
Habermeier, Jurgen; and Buxbaum, Lothar, 4,108,841, Cl. 528-289.000.

BVM Ltd.: *See*—
Vary, Robert F.; and Mamo, Anthony C., 4,108,238, Cl. 165-57.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Amschler, Hermann, 4,108,982, Cl. 424-73.000.

Bynam, Holland Eldridge. Golf board game apparatus. 4,108,442, Cl. 273-237.000.

Byrum, Bernard W., Jr.: *See*—
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,109,176, Cl. 313-220.000.

C. Cowles & Company: *See*—
Skarzynski, Thaddeus S.; and Swisher, James A., 4,107,959, Cl. 70-159.000.

C.F. Scheer & Cie.: *See*—
Fritsch, Rudolph Paul, 4,108,588, Cl. 425-185.000.

C. J. Hendry Company: *See*—
Day, Ronald H., 4,108,204, Cl. 137-543.130.

Cable, Walter Lester; Binge, Derek Sidney; and Korosec, Rudolph Francis, to RCA Corporation. Adjustment device. 4,108,407, Cl. 248-23.000.

Cady, Philip D.: *See*—
Blankenhorn, Paul R.; Cady, Philip D.; Kline, Donald E.; and Weyers, Richard E., 4,109,033, Cl. 427-314.000.

Callaghan, John David, to RCA Corporation. Rotator with remote indicator and self-synchronization. 4,109,191, Cl. 318-673.000.

Calvert, Michael Arnold; and Senger, David Joseph, to TK Valve Limited. Ball valves. 4,108,196, Cl. 137-72.000.

Camara, Manuel. Game apparatus. 4,108,431, Cl. 273-1.00R.

Campbell Chain Company: *See*—
Fink, Richard H., 4,107,917, Cl. 59-85.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Felstead, E. Barry, 4,108,538, Cl. 350-162.0SF.
Ratte, Jacques; and Carignan, Pierre, 4,108,940, Cl. 264-140.000.

Canadian General Electric Company, Ltd.: *See*—
Eastcott, Peter DeH.; and Truman, Peter T., 4,108,280, Cl. 187-20.000.

Cannon, Robert Lee: *See*—
Day, Christopher Cameron; and Cannon, Robert Lee, 4,109,243, Cl. 340-324.00R.

Cannon, Robert Lee, III, to Thaler, Sheldon. Pacer with automatically variable A-V interval. 4,108,148, Cl. 128-419.0PG.

Canon Kabushiki Kaisha: *See*—
Goshima, Takeshi; and Endo, Kiyonobu, 4,109,045, Cl. 428-212.000.
Hirose, Ryusho; and Wakui, Kotaro, 4,109,279, Cl. 358-55.000.
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,108,427, Cl. 271-9.000.
Kuge, Tsukasa; and Tanigawa, Koichi, 4,109,289, Cl. 361-230.000.
Minoura, Kazuo, 4,108,532, Cl. 350-6.600.
Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, 4,109,257, Cl. 354-23.00R.

Cantrell, Seals R. Portable dock. 4,107,932, Cl. 61-48.000.

Cantrell, Steve Garner: *See*—
Besenfelder, Edward Roald; Cantrell, Steve Garner; and Cobeen, Charles Peter, 4,109,236, Cl. 340-146.10F.

Caponegro, Mike A.: *See*—
Stine, Clifton E.; Chartier, Woodrow D., Jr.; and Caponegro, Mike A., 4,108,025, Cl. 81-3.00R.

Cardenas-Franco, Luis, to Investigacion Fic Fideicomiso. Electronic control system for glassware and other thermoplastic articles forming machines. 4,108,623, Cl. 65-163.000.

Cardenas, Ricardo L.: *See*—
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,108,193, Cl. 137-13.000.

Cargile, William P. Method and apparatus for testing shock absorbers and the like. 4,107,975, Cl. 73-11.000.

Carignan, Pierre: *See*—
Ratte, Jacques; and Carignan, Pierre, 4,108,940, Cl. 264-140.000.

Carl Schenk AG, Firma: *See*—
Beutel, Rudolf, 4,109,312, Cl. 364-508.000.

Carlin, Joseph T.: *See*—
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,108,193, Cl. 137-13.000.

Carlizza, Jean: *See*—
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,108,650, Cl. 75-206.000.

Carlson, Gordon R. Flushing technique and apparatus for outboard and stern-drive motors. 4,108,190, Cl. 134-167.00R.

Carlson, Robert Dale: *See*—
Jacques, James O.; and Carlson, Robert Dale, 4,109,189, Cl. 318-608.000.

Carlsson, Lars Ivar: *See*—
Andersson, Bo Eric Christer; Carlsson, Lars Ivar; and Johnsson, Rolf Christer Roland, 4,109,060, Cl. 425-566.000.

Carmody, Joseph P., to Honeywell Inc. Resistance measuring circuit. 4,109,196, Cl. 324-62.000.

Carnaud Total Interplastic: *See*—
Martineu, Pierre; and Gregoire, Jean-Francois, 4,108,937, Cl. 264-89.000.

Carney, Leroy L., to Halliburton Company. Oil well fluids and dispersants. 4,108,779, Cl. 252-8.50P.

Caron, LaVerne A., to Chrysler Corporation. Circuitry for generating ramp type signals. 4,109,164, Cl. 307-228.000.

Carrier Corporation: *See*—
Bolton, Theodore S.; and High, Charles N., 4,107,939, Cl. 62-89.000.
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,108,261, Cl. 177-120.000.
Miller, Kenneth H.; and Kropiwnicki, Tadek M., 4,108,581, Cl. 417-363.000.

Carroll, Eugene Thomas: *See*—
Austin, Terry Marshall; Carroll, Eugene Thomas; and Bowen, Mildred Choi, 4,108,552, Cl. 356-87.000.

Carstens, Marion R.; and Bates, Homer J., to Georgia Tech Research Institute. Releasable stop for a vehicle moving through a conduit. 4,108,079, Cl. 104-252.000.

Carter, William Edward; and Cosentino, Italo Americo, to Modular Conceptual Systems, Inc., by said William E. Carter. Self-contained comfort station. 4,107,795, Cl. 4-313.000.

Casillo, Santo. Crocheting tool. 4,107,953, Cl. 66-1.00R.

Cassandrini, Paolo; and Tozzi, Antonio, to Chimosa Chimica Organica S.p.A. Piperidyl-triazine derivatives as stabilizers for synthetic polymers. 4,108,829, Cl. 260-45.8NT.

Cassel, Harrison E.: *See*—
Baelz, Harry C.; and Cassel, Harrison E., 4,109,119, Cl. 200-38.0BA.

Castellano, Joseph Anthony; and McCaffrey, Michael Thomas, to RCA Corporation. Liquid crystal cell. 4,108,793, Cl. 252-299.000.

Casiglia, Ignatius F. Maternity brace. 4,108,149, Cl. 128-579.00R.

Catanese, Carmen Anthony; Endriz, John Guiry; and Keneman, Scott Allen, to RCA Corporation. Electron multiplier with switchable beam confinement structure. 4,109,178, Cl. 315-12.00R.

Caterpillar Tractor Co.: *See*—
Baer, Terry G.; and Klopfenstein, Wayne A., 4,108,233, Cl. 157-1.370.
Bailey, John M., 4,108,130, Cl. 123-139.0AQ.
Dezelan, Joseph E., 4,107,924, Cl. 60-445.000.
Gordon, Phillip B., Jr.; and Hunt, Keats E., 4,107,927, Cl. 60-605.000.
Kelley, James E.; and Stemler, Orrin A., 4,108,561, Cl. 403-166.000.
Merkel, Russell D., 4,108,250, Cl. 172-719.000.
Vinton, David S., 4,108,470, Cl. 280-677.000.
Wirt, Leon A., 4,108,224, Cl. 144-34.00E.

Caunt, Anthony David; Fortuin, Michael Stanley; and Williams, Ian Gabriel, to Imperial Chemical Industries Limited. Treatment of transition metal compound. 4,108,796, Cl. 252-429.00B.

Cejka, Alena: *See*—
Plum, Hans; Buschhoff, Max; and Cejka, Alena, 4,108,990, Cl. 424-245.000.

Cenker, Moses: *See*—
Narayan, Thirumurti; and Cenker, Moses, 4,108,808, Cl. 521-181.000.
Narayan, Thirumurti; and Cenker, Moses, 4,108,809, Cl. 521-136.000.

Central Research Institute of Electric Power Industry: *See*—
Kanagawa, Tadashi; and Nakasa, Hiroyasu, 4,107,981, Cl. 73-88.00E.

Central Soya Company, Inc.: *See*—
Szuhaj, Bernard F.; and Yaste, Joseph R., 4,108,678, Cl. 106-243.000.

Centro Sperimentale Metallurgico S.p.A.: *See*—
Palumbo, Luigi; Colletta, Angelo; and Giromella, Giampaolo, 4,108,731, Cl. 201-8.000.

Cepasy AG: *See*—
Lander, Lars Bengt, 4,108,513, Cl. 312-39.000.

Cerberus AG.: *See*—
Scheidweiler, Andreas, 4,109,240, Cl. 340-629.000.

Ceribelli, Giorgio. Feeding apparatus for device for forming bales of incoherent material. 4,108,064, Cl. 100-187.000.

Chalk, Alan J.; and Gilbert, Alfred R., to General Electric Company. Polyphenylene polymers and methods for making the same. 4,108,942, Cl. 260-875.000.

Chambers, William John; and Foss, Robert Paul, to Du Pont de Nemours, E. I., and Company. Photosensitive polyaldehydes and use in photoimaging. 4,108,839, Cl. 528-270.000.

Champ, Michel Andre: *See*—
Nabucet, Georges Joseph; and Champ, Michel Andre, 4,108,071, Cl. 102-24.0HC.

Champion International Corporation: *See*—
Craig, Gerald; Evans, Wilbur G.; and Potts, Everett L., Jr., 4,109,056, Cl. 428-512.000.
Tellman, Stephen J., 4,109,041, Cl. 428-147.000.

Chang, Joseph Jawshin, to Western Electric Company, Inc. Method of fabricating a printed circuit board. 4,107,837, Cl. 29-625.000.

Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Semiconductor device manufacture. 4,108,685, Cl. 148-1.500.

Chang, Shung-Ho: *See*—
Regnier, Frederick E.; and Chang, Shung-Ho, 4,108,603, Cl. 23-230.00B.

Channin, Donald Jones, to RCA Corporation. Matrix address system using erase operation. 4,109,242, Cl. 340-324.00M.

Chapdelaine, William E.: *See*—
Hauray, Guy J. L.; and Chapdelaine, William E., 4,108,415, Cl. 248-370.000.

Chapin, Leonard Lee; and Merrick, James Walter, to Autotronic Controls, Corp. Modulated throttle bypass. 4,108,127, Cl. 123-124.00R.

Chapman, Derek D., to Eastman Kodak Company. Photographic compositions and elements containing benzo[a]quinolizinium methine dyes. 4,108,667, Cl. 96-131.000.

Charquet, Daniel: *See*—
Armand, Marcel; and Charquet, Daniel, 4,108,687, Cl. 148-2.000.

Chartier, Woodrow D., Jr.: *See*—
Stine, Clifton E.; Chartier, Woodrow D., Jr.; and Caponegro, Mike A., 4,108,025, Cl. 81-3.00R.

Chasman, Richard Allan: *See*—
Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, 4,108,850, Cl. 260-162.000.

Chekotilo, Leonty Vasilievich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Chelminski, Stephen V., to Bolt Associates, Inc. Seismic land source. 4,108,271, Cl. 181-119.000.

Chemic-Anlagenbau Bischofsheim GmbH: *See*—
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,807, Cl. 521-118.000.

Chemical Consults Corp., Ltd.: *See*—
Weiss, Josef, 4,108,771, Cl. 210-50.000.

Chemie-Anlagenbau Bischofsheim GmbH: *See*—
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,954, Cl. 264-216.000.

Chemiefaser Lenzing Aktiengesellschaft: *See*—
Sasshofer, Franz; Gotschy, Friedrich; Krassig, Johannes; and Wimmer, Adalbert, 4,107,827, Cl. 28-246.000.

Chen, Albert C.: *See*—
Brown, George L.; and Chen, Albert C., 4,108,816, Cl. 260-29.40R.

Chen, Augustin T.; and Onder, Kemal B., to Upjohn Company, The. Copolymers of polyparabanic acids and polyamide-imides. 4,108,843, Cl. 528-74.000.

Chen, Nai Yuen; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Method for treatment of rubber and plastic wastes. 4,108,730, Cl. 201-2.500.

Cherenko, Joseph; and Lewis, Charles W., to PPG Industries, Inc. Laminated windshield with improved innerlayer. 4,109,055, Cl. 428-437.000.

Chervenak, Robert A., to Comerco, Inc. Pull tray. 4,108,519, Cl. 312-320.000.

Chevron Research Company: *See*—
Frost, Kenneth A., Jr., 4,108,613, Cl. 44-62.000.

Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, to Commissariat a l'Energie Atomique; and Institut National de la Recherche Agronomique. Method and an installation for the air-conditioning of greenhouses and frames. 4,108,373, Cl. 237-1.00A.

Chiaramonte, Vincent T., to Apex Dental Lab. Inc. Alloy for preparing dentures therefrom. 4,108,642, Cl. 75-134.00F.

Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,108,040, Cl. 84-1.190.

Chielens, Alain; Marchal, Gerard; and Gesquiere, Michel, to Fives-Cail Babcock. Support device for a cylindrical rotary member. 4,108,410, Cl. 248-130.000.

Chikashige, Kiyoshi; and Ohuchi, Teruo. Twisted wire brush with threaded assembly for collecting cells. 4,108,162, Cl. 128-2.00B.

Chimosa Chimica Organica S.p.A.: *See*—
Cassandrini, Paolo; and Tozzi, Antonio, 4,108,829, Cl. 260-45.8NT.

Chmiel, Horst, to Linde Aktiengesellschaft. Method of and apparatus for the deep freezing of biological substances. 4,107,937, Cl. 62-64.000.

Christ, Guenter: *See*—
Liebscher, Guenther; and Christ, Guenter, 4,108,082, Cl. 105-464.000.

Christ, Thomas; and Langguth, Robert P., to Monsanto Company. Detergent compositions and processes utilizing same. 4,108,801, Cl. 252-544.000.

Christe, Karl O., to Rockwell International Corporation. $(NF_4)_2NiF_6$ High energy solid propellant oxidizer and method of producing the same. 4,108,965, Cl. 423-351.000.

Christensen, Rolf Edward, to Scott Paper Company. Tension wire metering of applicator roll. 4,109,035, Cl. 427-365.000.

Christiansen, Soren Bent, to F. L. Smidth & Co. Method of heat treating pulverulent or granular raw materials and kiln plant therefor. 4,108,593, Cl. 432-14.000.

Chromalloy Farm and Industrial Equipment Co.: *See*—
Anderson, Carl M.; and Poland, Robert L., 4,108,249, Cl. 172-328.000.

Chrysler Corporation: *See*—
Caron, LaVerne A., 4,109,164, Cl. 307-228.000.

Chu, Ta-Shing, to Bell Telephone Laboratories, Incorporated. Method and apparatus for substantially reducing cross polarized radiation in offset reflector antennas. 4,109,253, Cl. 343-756.000.

CIBA-GEIGY AG: *See*—
Wright, Peter John, 4,108,802, Cl. 526-17.000.

Ciba-Geigy Corporation: *See*—
Audykowski, Thaddeus, 4,108,815, Cl. 260-29.2EP.
Buxbaum, Lothar, 4,108,834, Cl. 528-289.000.
Habermeier, Jurgen; and Buxbaum, Lothar, 4,108,841, Cl. 528-289.000.

Ciecior, Heinrich, to Singer Company, The. Needle bar drive stabilizing arrangement. 4,108,096, Cl. 112-221.000.

Cilurzo, Joseph William: *See*—
Aldridge, Clarence Foster; Storey, Leo Martin, Jr.; and Cilurzo, Joseph William, 4,108,310, Cl. 206-570.000.

Cime Bocuze: *See*—
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,108,650, Cl. 75-206.000.

Cincinnati Milacron Inc.: *See*—
Jessup, Wilbur F., 4,107,881, Cl. 51-103.00R.

Cipris, Divna; and Pouli, Dirk, to Allied Chemical Corporation. Selenium-containing coating for valve metal electrodes and use. 4,108,745, Cl. 204-129.000.

Citizen Watch Co., Ltd: *See*—
Sekiya, Fukuo; Morokawa, Shigeru; and Nomura, Yasushi, 4,107,915, Cl. 58-23.00R.

Cla-Val Co.: *See*—
Ensign, Harold W.; and Zieg, Clifford V., 4,108,418, Cl. 251-5.000.

Claassen, George Richard, to PPG Industries, Inc. Supporting a glass sheet for press bending. 4,108,624, Cl. 65-273.000.

Claiborne, Floyd H.; and Ray, Roggie C. Paint roller cleaner and dryer. 4,108,189, Cl. 134-138.000.

Clark, Charles Albert, Jr.; and Adam, Kenneth Charles, to RCA Corporation. Clamping circuit. 4,109,166, Cl. 307-237.000.

Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., to American Tennis Systems, Inc. Tennis ball collection, pick-up and propelling system. 4,108,432, Cl. 273-29.00A.

Clarke-Gravely Corporation: *See*—
Block, Thomas S., 4,108,268, Cl. 180-74.000.

Claudius Peters AG and Maxpeters Gesellschaft fuer Verfahrenstechnik mbH: *See*—
Stamer, Walter, 4,108,500, Cl. 302-53.000.

Claussen, Donald F.; and Gagnon, Ronald A., to Armstrong Cork Company. Relocatable suspended light fixture. 4,109,305, Cl. 362-418.000.

Clendening, Francis Joseph, Jr.; and Rose, Elva Lincoln, to Du Pont de Nemours, E. I., and Company. Yarn treating jet. 4,107,828, Cl. 28-254.000.

Clinard, Ralph L., Jr., to Lord Corporation. Frustroconical laminated bearing. 4,108,508, Cl. 308-238.000.

Cline, Harvey E.: *See*—
Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., 4,108,685, Cl. 148-1.500.

Clodfelter, Glen A., to United States of America, Army. Method of making coned joint for joining dissimilar diameter filament wound tubes. 4,108,700, Cl. 156-153.000.

Clopay Corporation: *See*—
Brookshire, Phillip L., 4,108,698, Cl. 156-60.000.
Lee, Maw Huei, 4,107,877, Cl. 49-28.000.

Clough, George Francis Gilbert, to Imperial Chemical Industries Limited. Continuous treatment of liquid effluent and sewage. 4,108,763, Cl. 210-14.000.

Coal Industry (Patents) Limited: *See*—
Williams, Derek Farnham; and Martin, Terence Geoffrey, 4,108,760, Cl. 208-11.0LE.

Cobeen, Charles Peter: *See*—
Besenfelder, Edward Roald; Cantrell, Steve Garner; and Cobeen, Charles Peter, 4,109,236, Cl. 340-146.10F.

Cockram, David Ralph, to Pilkington Brothers Limited. Polyhydroxy aromatic coating compositions for reinforcing glass fibers used in cementitious products. 4,109,051, Cl. 428-375.000.

Coen, Manus; and Bonfield, Joseph, to Eastern Bindery, Inc. Perfect bound sample book with integral handle. 4,108,473, Cl. 281-29.000.

Coggiola, James P., to General Electric Company. Steam iron. 4,107,860, Cl. 38-77.830.

Cognacq, Jean-Calude; Schweisguth, Bernard; and Teulon, Jean-Marie, to Hexachimie. Hydrazine derivatives useful as anti-hypertensives. 4,109,008, Cl. 424-273.00R.

Cohrs, William E.; and Gunderman, Roland E., to Dow Chemical Company, The. Thermoplastic expandable microsphere process and product. 4,108,806, Cl. 521-54.000.

Coleman, James T. Portable runway with longitudinal supports and tension holding means. 4,108,435, Cl. 273-55.00R.

Colgate-Palmolive Company: *See*—
Duff, Edward John, 4,108,980, Cl. 424-52.000.
Kenkare, Divaker B.; and Shumway, Durland K., 4,108,977, Cl. 424-46.000.
Schaar, Charles, 4,108,179, Cl. 128-284.000.

Coll-Palagos, Miguel; and Surridge, James H., to Stauffer Chemical Company. High water content emulsion cleaning. 4,108,599, Cl. 8-137.000.

Collard, James C.; and Martin, Wesley G., to Kraft, Inc. Releasable coupling. 4,108,562, Cl. 403-254.000.

Colletta, Angelo: *See—*
Palumbo, Luigi; Colletta, Angelo; and Giromella, Giampaolo, 4,108,731, Cl. 201-8.000.
Colton, Frank B.: *See—*
Brown, Edward A.; and Colton, Frank B., 4,108,851, Cl. 260-239.570.
Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D.; and Hawkins, Harold V., 4,108,014, Cl. 74-243.00H.
Combs, Charles S., Jr.: *See—*
Ashmore, Charles I.; Combs, Charles S., Jr.; and Stephens, William D., 4,108,696, Cl. 149-19.200.
Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, to Precision Monolithics, Inc. Dual mode output amplifier for a sample and hold circuit. 4,109,215, Cl. 330-254.000.
Comerco, Inc.: *See—*
Chervenak, Robert A., 4,108,519, Cl. 312-320.000.
Commissariat a l'Energie Atomique: *See—*
Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, 4,109,153, Cl. 250-499.000.
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.
Onillon, Michel; Roche, Pierre; and Thenard, Jean, 4,109,159, Cl. 250-564.000.
Pigeon, Michel; and Saglio, Robert, 4,109,201, Cl. 324-227.000.
Compagnie Generale d'Electricite: *See—*
Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, 4,109,066, Cl. 429-145.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris": *See—*
Lamy, Jacques Edouard, 4,107,933, Cl. 61-107.000.
Patinet, Jean-Francois; and Guiomard, Claude, 4,107,802, Cl. 9-400.000.
Compagnie Honeywell Bull (Societe Anonyme): *See—*
Dehaine, Gerard, 4,109,096, Cl. 174-68.500.
Companion Pty. Limited: *See—*
Barson, Leslie; and Davis, Frederick Charles, 4,108,142, Cl. 126-41.00R.
Comstook & Wescott, Inc.: *See—*
Rice, Richard E., 4,108,797, Cl. 252-466.0PT.
Concept Inc.: *See—*
Hartman, Robert M.; and Trott, Arthur F., 4,108,182, Cl. 128-305.000.
Conery, William J.; and Kiplinger, Terry L., to McNeil Corporation. Grinder pump. 4,108,386, Cl. 241-46.110.
Conibear, Frank; and Verstraaten, Peter, to Woodstream Corporation. Actuator. 4,107,868, Cl. 43-88.000.
Conlon, Charles M., Jr.: *See—*
Billing, Rudolph W., Jr.; and Conlon, Charles M., Jr., 4,108,074, Cl. 102-92.700.
Conn, John L. Wrist band case for housing a watch and/or a mini computer or calculator. 4,108,340, Cl. 224-4.00E.
Connor, Daniel Stedman, to Procter & Gamble Company, The. Preparing alkane phosphonic acids and intermediates. 4,108,889, Cl. 260-502.40R.
Connoy, Thomas Patrick, to Kroy Industries, Inc. Printing piston assembly. 4,108,556, Cl. 400-48.000.
Conrow, Ransom Brown: *See—*
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,108,890, Cl. 260-507.00R.
Continental Group, Inc., The: *See—*
Khoury, Nick S., 4,108,331, Cl. 220-269.000.
Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Tiemann, Reinhard, 4,108,228, Cl. 152-7.000.
Continental Oil Company: *See—*
Leach, Bruce Eugene; and Starks, Charles M., 4,108,909, Cl. 568-766.000.
Moore, Richard G., III, 4,108,256, Cl. 175-61.000.
Sias, Roy C., 4,109,010, Cl. 424-289.000.
Cook, Charles F.; and Hays, George E., to Phillips Petroleum Company. Natural gas recovery method. 4,108,244, Cl. 166-268.000.
Cook, Peter Henry; and Holmes, Joseph Arthur Henry, to B & H Commercial Inventors & Designers Limited; and Cook, Peter Henry. Educational toys. 4,107,853, Cl. 35-35.00H.
Cook, Steven R., to Digital Switch Corporation. Method and apparatus for establishing conference calls in a time division multiplex pulse code modulation switching system. 4,109,111, Cl. 179-18.0BC.
Cooper, William D., to Georgia-Pacific Corporation. Separation of an aqueous or water-miscible liquid from a fluid mixture. 4,108,767, Cl. 210-42.00S.
Copa, Company Limited: *See—*
Arisaka, Kunio; and Harada, Hiroyuki, 4,109,258, Cl. 354-38.000.
Copal Company Limited: *See—*
Inoue, Nobuyoshi, 4,109,266, Cl. 354-246.000.
Yaguinuma, Jusuke, 4,108,355, Cl. 235-1.00C.
Copelin, Harry Bugbird, to Du Pont de Nemours, E. I., and Company. Preparation of an acetal from a diol and acrolein. 4,108,869, Cl. 260-340.700.
Coq B.V.: *See—*
Boersma, Rintje; and Irik, Gijsbert Waldemar, 4,109,124, Cl. 200-148.00B.
Corey, George. Rack and pinion wave motor power plant. 4,108,578, Cl. 417-331.000.
Cornelius, Gail, to R. M. Wade & Co. Brake apparatus for irrigation line. 4,108,200, Cl. 137-344.000.
Cornish, Eldon C.: *See—*
Millard, Joe K.; and Cornish, Eldon C., 4,109,183, Cl. 315-392.000.
Cosentino, Italo Americo: *See—*
Carter, William Edward; and Cosentino, Italo Americo, 4,107,795, Cl. 4-313.000.
Cosentino, Louis Salvatore; Endriz, John Guiry; and Stockdale, George Fairbank, to RCA Corporation. Electrical connection between conductors on spaced plates. 4,109,299, Cl. 361-412.000.
Costello, Alan Thomas: *See—*
Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.
Cote, Bernard. Roller skate. 4,108,450, Cl. 280-7.130.
Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Hydroxyalkylthio phenolic antioxidants. 4,108,831, Cl. 260-45.95C.
Cotton Incorporated: *See—*
Mueller, Klaus Karl; and Loughlin, James Osborn E., 4,108,597, Cl. 8-115.000.
Cotton, Worth, Jr.; and Hunter, A. Reese, to Industrial Air, Inc. Modular building panel with heat nonconducting means. 4,107,891, Cl. 52-394.000.
Coughlin, John Edward: *See—*
Venetta, Henry John; Singrey, Raymond Edward; and Coughlin, John Edward, 4,108,594, Cl. 432-24.000.
Coulouris, George Franklin: *See—*
Robertson, Penrose David; and Coulouris, George Franklin, 4,109,282, Cl. 358-127.000.
Courtaulds Limited: *See—*
Robinson, Frank; and Whatmough, Nigel Stephen, 4,107,955, Cl. 66-176.000.
Cousino, Walter F. Impact actuated lawn mower. 4,107,906, Cl. 56-246.000.
Cox, Roger Flavius: *See—*
Moog, Robert A.; and Cox, Roger Flavius, 4,108,041, Cl. 84-1.240.
Coxon, Brian; and Leventhall, Hubert Geoffrey, to National Research Development Corporation. Attenuation of sound waves in ducts. 4,109,108, Cl. 179-1.00P.
CPC International Inc.: *See—*
Deaton, Irving F., 4,109,075, Cl. 536-1.000.
Crabtree, George Frederick. Motor work stand. 4,108,425, Cl. 269-71.000.
Craig, Gerald; Evans, Wilbur G.; and Potts, Everett L., Jr., to Champion International Corporation. Starch/latex cast coatings for paper. 4,109,056, Cl. 428-512.000.
Craig, William A. Hip splint device. 4,108,168, Cl. 128-80.00A.
Crane, Robert L.; Grandt, Alten F., Jr.; and Gallagher, Joseph P., to United States of America, Air Force. Assessment of flaw growth potential in structural components. 4,107,980, Cl. 73-88.00R.
Craven, Charles G. Hanger for racquets. 4,108,312, Cl. 211-13.000.
Creekmore, Robert V., to 1st Natl. Bank of Atlanta. Apparatus for verifying checks presented for acceptance. 4,109,238, Cl. 340-149.00A.
Creighton, Charles P.; and Teschemacher, Charles R., to Alden Optical Laboratories, Inc. Process for preparing a hydrophilic water insoluble polymer and the resulting polymer and polymer articles. 4,109,074, Cl. 526-320.000.
Creinin, Howard Lee; and Shemer, Michael, to Miles Laboratories, Inc. Method for preparing bland protein enriched products from grain gluten. 4,108,847, Cl. 260-112.00G.
Cremer, Charles W., to A. E. Staley Manufacturing Company. Potato product. 4,109,024, Cl. 426-550.000.
Crescentini, Lamberto; Weedon, Gene Clyde; and Wells, Rodney Lee, to Allied Chemical Corporation. Antistatic fiber containing multiple branched propoxylated-ethoxylated polyalkylenepolyamines and monoamines and their chain-extended reaction products. 4,108,922, Cl. 260-830.00P.
Cricchi, James R.; and Fitzpatrick, Michael D., to Westinghouse Electric Corp. High speed, radiation hard complementary MOS capacitive voltage level shift circuit. 4,109,163, Cl. 307-205.000.
Crinkelmeyer, Oliver W.; and Morris, Earl F., to Dow Chemical Company, The. High-alumina cement. 4,108,930, Cl. 264-32.000.
Crivello, James V., to General Electric Company. Curable compositions and method for curing such compositions. 4,108,747, Cl. 204-159.180.
Crompton & Knowles Corporation: *See—*
Osgood, John H., 4,108,215, Cl. 139-438.000.
Crooks, Frederick. Load-bearing walls and similar structures. 4,107,899, Cl. 52-747.000.
Crose, James R., to W. R. Grace & Co. Electrostatic coating apparatus and method. 4,109,027, Cl. 427-28.000.
Cross River Products, Inc.: *See—*
Sloan, James L.; and Meeker, Greg W., 4,107,817, Cl. 16-20.000.
Crouse-Hinds Company: *See—*
Berry, Richard C., 4,109,097, Cl. 174-86.000.
Csanyi, Endre: *See—*
Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.
Cuer, Jean-Pierre; and Floreancig, Antoine, to Produits Chimiques Ugine Kuhlmann. Process for purifying phosphoric acid. 4,108,963, Cl. 423-321.00S.

Culp, Harold G.: *See—*
McMillian, Lonnie S.; and Culp, Harold G., 4,109,139, Cl. 235-92.0CN.

Cunningham, Newton T. Apparatus for producing alcohol from grains of starch materials. 4,108,052, Cl. 99-275.000.

Curt G. Joa, Inc.: *See—*
Radzins, Edmund A.; and Kiela, Gene F., 4,108,584, Cl. 425-83.100.

Cutler-Hammer, Inc.: *See—*
Halbeck, Werner B., 4,109,126, Cl. 200-302.000.

Cutters Machine Company, Inc.: *See—*
McHenry, Joe M., Jr., 4,108,293, Cl. 192-67.00R.

Dahlberg, Stellan, to Rockwool Aktiebolaget. Method for continuous weighing of a continuous bandformed or matformed material, and an arrangement for execution of the method. 4,108,344, Cl. 226-1.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.

Daimler-Benz Aktiengesellschaft: *See—*
Peter, Wolfgang; Koch, Heinz; and Stubenvoll, Alfred, 4,108,689, Cl. 148-6.15R.
Thoma, Frank, 4,108,383, Cl. 239-533.500.

Dale Products, Inc.: *See—*
Simonton, Robert D.; and Schultz, Carl D., 4,108,417, Cl. 249-81.000.

Dalton, Oliver, to Tektronix, Inc. Delayed sweep system for an oscilloscope. 4,109,182, Cl. 315-392.000.

Damagnez, Jacques A.: *See—*
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.

D'Amico, John J.: *See—*
Bollinger, Frederic G.; and D'Amico, John J., 4,108,627, Cl. 71-91.000.
Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., 4,108,632, Cl. 71-115.000.

Dana Corporation: *See—*
Anderson, George J.; and Bell, Roscoe Lee, 4,108,448, Cl. 277-157.000.
Unger, Ronald James; and Spoonamore, John Gilbert, 4,107,984, Cl. 73-113.000.

Dangelmaier, Karl; and Kottmann, Alfred, to L. Schuler GmbH. Aligning and stacking arrangement. 4,108,031, Cl. 83-90.000.

Dangelmaier, Karl: *See—*
Bareis, Alfred; Dangelmaier, Karl; and Braun, Reinhard, 4,108,320, Cl. 214-8.000.

Dant & Russell, Inc.: *See—*
Potter, Edward, 4,108,377, Cl. 238-91.000.

Dante, Mark F., to Shell Oil Company. Low-temperature curable saturated epoxy resin compositions. 4,108,824, Cl. 260-33.2EP.

Danze, Carlos: *See—*
Shonerd, David E.; and Danze, Carlos, 4,108,327, Cl. 220-3.000.

Dardoufas, Kimon Constantine: *See—*
Marshall, Robert Moore; and Dardoufas, Kimon Constantine, 4,108,781, Cl. 252-8.900.

Dart Industries Inc.: *See—*
Dick, Franklin; and Seckel, Peter H., 4,108,559, Cl. 401-217.000.

Das, Salil K.: *See—*
Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.

Das, Suryya K.: *See—*
Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,108,750, Cl. 204-181.00R.

Das Gupta, Sankar: *See—*
Fleet, Bernard; and Das Gupta, Sankar, 4,108,754, Cl. 204-263.000.
Fleet, Bernard; and Das Gupta, Sankar, 4,108,755, Cl. 204-263.000.
Fleet, Bernard; and Das Gupta, Sankar, 4,108,757, Cl. 204-294.000.

Dash, Glen R., to Massachusetts Institute of Technology. Television interface device. 4,109,280, Cl. 358-86.000.

Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, to Eli Lilly and Company. Fungicidal 3-phenyl-5-(substituted methyl) isoxazoles. 4,109,002, Cl. 424-272.000.

Davenport Tool Co.: *See—*
Lenker, Paul E., 4,108,027, Cl. 81-60.000.

Davies, Norman, to Westinghouse Electric Corp. Tubular conductor for metal clad switchgear. 4,109,293, Cl. 361-341.000.

Davis, Dale M., to United States of America, Air Force. Armor piercing projectile. 4,108,073, Cl. 102-52.000.

Davis, Frederick Charles: *See—*
Barson, Leslie; and Davis, Frederick Charles, 4,108,142, Cl. 126-41.00R.

Davis, George T.: *See—*
Epstein, Joseph; and Davis, George T., 4,108,950, Cl. 260-986.000.

Davis, Glenn A., to Scientific-Atlanta, Inc. Radio frequency alarm system including transmitting, coding and decoding circuitry. 4,109,239, Cl. 340-539.000.

Davis, William F., to Motorola, Inc. Anti skid fault detection circuit. 4,109,234, Cl. 340-52.00B.

Dawson, Chester H., to Remington Arms Company, Inc. Method and machine for detecting and correcting tension of saw blades. 4,107,983, Cl. 73-100.000.

Day, Christopher Cameron; and Cannon, Robert Lee, to American Optical Corporation. Data sequence display system and time-compression system therefor. 4,109,243, Cl. 340-324.00R.

Day, Ronald H., to C. J. Hendry Company. Pressure relief valve. 4,108,204, Cl. 137-543.130.

de la Bastie, Joseph: *See—*
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,108,650, Cl. 75-206.000.

DeAnda, Nicholas; Dyer, Robert F.; and Newbold, Roger A., to Mattel, Inc. Toy vehicle starting and launching set. 4,108,437, Cl. 273-86.00D.

Deaton, Irving F., to CPC International Inc. Separation of saccharides by exclusion chromatography. 4,109,075, Cl. 536-1.000.

deBenneville, Peter L.: *See—*
Johnson, Richard C.; and deBenneville, Peter L., 4,109,006, Cl. 424-277.000.

de Boer, Henri G. J.; van der Breggen, Gerrit; and Wemmers, Anton, to GAF Corporation. Light-sensitive negative-working film containing a diazo oxide sensitizer and a p-toluenesulfonyl halide or a 2,4-dihalo-S-triazine. 4,108,664, Cl. 96-75.000.

de Cooker, Mario G. R. T.; and Hermus, Antonius J. M., to Stamicarbon, B.V. Method of preparing cyanuric acid. 4,109,089, Cl. 544-192.000.

Deere & Company: *See—*
Wohlford, William Paul, 4,108,502, Cl. 305-14.000.

Deets, Gary L., to Monsanto Company. Polymer compositions evolving reduced amounts of noxious gases on combustion. 4,109,067, Cl. 526-4.000.

de Fillain, Paul de Cointet: *See—*
Pigerol, Charles; de Fillain, Paul de Cointet; Grain, Claude; and Le Blay, Jacques, 4,108,865, Cl. 260-329.00R.

de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Inertiabrake control for input shaft of gear box, and its application to clutches and units formed by a clutch and a gear-box. 4,108,295, Cl. 192-111.00A.

de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Method of making a friction disc. 4,108,699, Cl. 156-92.000.

Deguchi, Masanobu: *See—*
Mitsuyama, Akira; Uchiyama, Hiroaki; and Deguchi, Masanobu, 4,108,544, Cl. 355-8.000.

de Haan, Douwe Rienk; and Kettenes, Dirk Karel, to P.F.W. Beheer B.V. Flavoring with trans, E-1-crotonoyl-2,2,6-trimethylcyclohexane. 4,109,022, Cl. 426-538.000.

De Haeck, Robert, to La Soudure Electrique Autogene, Procedes Arcos. Flux-cored wire for electric arc welding. 4,109,059, Cl. 428-558.000.

Dehaine, Gerard, to Compagnie Honeywell Bull (Societe Anonyme). Conditioning supports of micro-plates of integrated circuits. 4,109,096, Cl. 174-68.500.

Deichelmann, Hermann: *See—*
Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.

Del-Tronics Associates, Inc.: *See—*
Denman, Donald E.; and Haring, Samuel L., 4,109,112, Cl. 179-81.00R.

Delaplaine, Delano. Golf putting game. 4,108,440, Cl. 273-176.00E.

DeLapp, Darwin Fiske, to Formica Corporation. Low pressure melamine resin laminates. 4,109,043, Cl. 428-206.000.

Delourme, Raymond: *See—*
Tramier, Bernard; Delourme, Raymond; and Fresnel, Philippe, 4,108,866, Cl. 260-329.00R.

DEMAG Aktiengesellschaft: *See—*
Schneidersmann, Ernst-Otto, 4,108,496, Cl. 299-45.000.

Dembiak, Matthew Raymond; and Newton, Wayne McCall, to Western Electric Company, Incorporated. Dual jacketed cable. 4,109,099, Cl. 174-107.000.

Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corp. Furo[3,4-b]quinoline derivatives and pharmaceutical compositions and methods employing them. 4,108,998, Cl. 424-258.000.

Demi, Roy C., to Robertshaw Controls Company. Fuel control system having by-pass means and parts therefor and the like. 4,108,370, Cl. 236-15.00A.

Demichel, Pascal: *See—*
Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, 4,109,153, Cl. 250-499.000.

Denis, Pierre M.: *See—*
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.

Denman, Donald E.; and Haring, Samuel L., to Del-Tronics Associates, Inc. Telephone isolation device. 4,109,112, Cl. 179-81.00R.

Denner, Peter: *See—*
Joekel, Alfred; Langen, Hans; and Denner, Peter, 4,107,832, Cl. 29-157.3AH.

de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., to Oronzio de Nora Impianti Elecrtrochimici S.p.A. Bipolar electrode construction. 4,108,756, Cl. 204-286.000.

de Nora, Vittorio: *See—*
de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., 4,108,756, Cl. 204-286.000.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 1,4- and 4,10-Dihydro-4-oxo-pyrimido[1,2-a]benzimidazole-3-carboxylic acid amides. 4,109,087, Cl. 544-115.000.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1,4- and 4,10-dihydro-4-oxo-pyrimido[1,2-a]benzimidazole-3-carboxylic acid amides. 4,109,091, Cl. 544-250.000.

Derible, Pierre Henri: *See—*
Poittevin, Andre; Derible, Pierre Henri; and Fournex, Robert, 4,108,994, Cl. 424-250.000.

Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz,

to Feldmuhle Aktiengesellschaft. Recording material containing gamma-alumina. 4,109,048, Cl. 428-325.000.

De Steur, Hubert: *See—*
Helder, Johan; De Steur, Hubert; and Pernegger, Wolfgang, 4,108,555, Cl. 356-184.000.

Deutsch-Franzosisches Forschungsinstitut: *See—*
Trinks, Walter Louis Adolf; and Struth, Wolfgang Ferdinand, 4,108,072, Cl. 102-52.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Switch selectable harmonic strength control for a tone synthesizer. 4,108,039, Cl. 84-1.190.

Deutsche Babcock Aktiengesellschaft: *See—*
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
Amann, Herbert; and Morlock, Gerhard, 4,108,838, Cl. 528-249.000.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,875, Cl. 260-347.800.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,877, Cl. 260-347.800.

Devlin, Gerard P. Athletic shoe construction. 4,107,857, Cl. 36-129.000.

Dezelan, Joseph E., to Caterpillar Tractor Co. Pump upgrading system. 4,107,924, Cl. 60-445.000.

Diamond Shamrock Corporation: *See—*
Pohto, Gerald R.; and Kubrin, Michael Joseph, 4,108,752, Cl. 204-256.000.

Dick, Franklin; and Seckel, Peter H., to Dart Industries Inc. Ball point pen back end closure. 4,108,559, Cl. 401-217.000.

Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, to Compagnie Generale d'Electricite; and Institut National de Recherche Chimique Appliquee Ircha. Polyacrylic acid membranes for electrochemical use. 4,109,066, Cl. 429-145.000.

Didier Engineering GmbH.: *See—*
Steimann, Franz, 4,107,879, Cl. 49-465.000.

Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Structurally regulated polyphosphazene copolymers. 4,108,805, Cl. 521-180.000.

Dieterich, Dieter: *See—*
Reiff, Helmut; Wenzel, Wolfgang; Grammel, Jurgen; and Dieterich, Dieter, 4,108,814, Cl. 260-29.2TN.

Dietrich, Hagen; Fane, William J.; and Potschka, Joseph, to Norris Industries. Disengaging spindle locking mechanism. 4,108,482, Cl. 292-165.000.

Dietz-metall GmbH & Co. KG.: *See—*
Bauer, Hans, 4,108,141, Cl. 126-41.00R.

Digital Switch Corporation: *See—*
Cook, Steven R., 4,109,111, Cl. 179-18.0BC.

Dijkmans, Eise Carel: *See—*
Eggermont, Ludwig Desire Johan; Dijkmans, Eise Carel; and Riemens, Karel, 4,109,203, Cl. 325-38.00B.

Dini, Mamiliano, to European Rotogravure Association. Method of engraving printing plates of forms by means of energy beams, especially laser beams. 4,108,659, Cl. 96-36.300.

Dischert, Robert Adams: *See—*
Hopkins, Robert Sherman, Jr.; Banks, Arthur James; and Dischert, Robert Adams, 4,109,276, Cl. 358-4.000.

Ditzel, Heinz; and Ditzel, Werner. Indexing devices. 4,108,024, Cl. 74-813.00L.

Ditzel, Werner: *See—*
Ditzel, Heinz; and Ditzel, Werner, 4,108,024, Cl. 74-813.00L.

Dixon, Robert L.; and Maxsted, Malcolm D., to Smith International, Inc. Raise drill with removable stem. 4,108,259, Cl. 175-344.000.

Dobras, Bruce W., to Monarch Marking Systems, Inc. Coded record and method of and system for interpreting the record. 4,108,368, Cl. 235-463.000.

Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie K.G.: *See—*
Schal, Wilfried, 4,108,575, Cl. 417-53.000.

Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G.: *See—*
Fehrer, Ernst; Fuchs, Helmut; and Konig, Franz, 4,107,909, Cl. 57-5.000.

Dohle, Gunter: *See—*
Hain, Gottfried; Dohle, Gunter; Geist, Josef; and Schmidt, Rainer, 4,108,057, Cl. 99-452.000.

Dolbenko, Evgeny Tikhonovich: *See—*
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.

Dolco Packaging Corporation: *See—*
Kermoian, Gary H., 4,108,941, Cl. 264-154.000.

Dolling, William T.: *See—*
Sottosanti, Philip C.; Baker, William H.; and Dolling, William T., 4,108,381, Cl. 239-265.350.

Dominguez, Robert C.: *See—*
Spratt, Eugene M.; and Dominguez, Robert C., 4,108,411, Cl. 248-165.000.

Dondalski, William J.: *See—*
Prochazka, Svante; and Dondalski, William J., 4,108,929, Cl. 264-29.100.

Dongiovanni, Vincenzo: *See—*
Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.

Donn Products, Inc.: *See—*
Brown, Donald A.; LaLonde, Paul D.; and Koski, Gerald L., 4,108,563, Cl. 403-347.000.

Donnell, John Robinson; Heiter, George Ludwig; and Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Complementary distortion circuit. 4,109,212, Cl. 328-163.000.

Donohue, James M.; and Fisk, Bernard C., to Xerox Corporation. Programmable controller for controlling reproduction machines. 4,109,313, Cl. 364-518.000.

Doody, Thomas J., to United States of America, Energy. Multiple-port valve. 4,108,207, Cl. 137-625.470.

Dooley, Daniel Joseph: *See—*
Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, 4,109,215, Cl. 330-254.000.

Dorian, Mark: *See—*
Nelson, David H., 4,108,154, Cl. 126-270.000.

Douty, George Harold; Lucius, John Edward; and Leitzel, Larry Leon, to AMP Incorporated. Strain relief assembly. 4,108,527, Cl. 339-107.000.

Dow Chemical Company, The: *See—*
Baker, Ann Marie, 4,108,810, Cl. 521-129.000.
Cohrs, William E.; and Gunderman, Roland E., 4,108,806, Cl. 521-54.000.
Crinkelmeyer, Oliver W.; and Morris, Earl F., 4,108,930, Cl. 264-32.000.
McCarthy, James R.; and Moore, Jimmie L., 4,108,853, Cl. 544-245.000.
McKendry, Lennon H., 4,108,629, Cl. 71-94.000.
Rubens, Louis C.; and Alexander, Willard E., 4,108,934, Cl. 264-53.000.
Thompson, James L., 4,108,782, Cl. 252-8.55C.
Timm, Edward E.; and Townsend, Donald I., 4,108,113, Cl. 123-3.000.
Tong, Yulan C., 4,108,859, Cl. 260-296.00R.
Wasilczyk, George James, 4,108,791, Cl. 252-182.000.

Dow Corning Corporation: *See—*
Hahn, James R., 4,108,832, Cl. 528-32.000.
Hayes, William R., 4,108,825, Cl. 260-37.0SB.
Mahone, Louis G., 4,108,882, Cl. 260-448.20E.

Dozier, Alfred R., to Tylan Corporation. Cross-flow reactor. 4,108,106, Cl. 118-49.000.

Dracon Industries: *See—*
Mason, John Richard; and Foreman, Arthur L., 4,109,294, Cl. 361-399.000.

Draftex Development AG: *See—*
Andrzejewski, Heinz; Kruschwitz, Werner; and Bright, Robert G., 4,107,898, Cl. 52-716.000.

Dragerwerk Aktiengesellschaft: *See—*
Fleckenstein, Wolfgang; and Thiemann, Volker, 4,108,163, Cl. 128-2.00H.

Drapeau, Donald F.: *See—*
Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,109,222, Cl. 335-301.000.

Dreikorn, Barry A.: *See—*
Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, 4,109,002, Cl. 424-272.000.

Dresser Industries, Inc.: *See—*
Heske, William Albert, 4,109,147, Cl. 250-231.00P.
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,108,619, Cl. 55-192.000.

Dressler, Hans, to Koppers Company, Inc. Process for the preparation of polyalkylbenzene hydroperoxides. 4,108,907, Cl. 260-610.00B.

Dreyer, William J. Immunological reagent employing radioactive and other tracers. 4,108,972, Cl. 424-1.000.

Drzewiecki, Tadeusz M.; and Manion, Francis M., to United States of America, Army. Axisymmetric fluidic throttling flow controller. 4,108,721, Cl. 176-36.00R.

Dual Gebruder Steidinger: *See—*
Zimmerman, Heinrich, 4,108,514, Cl. 312-107.000.

Dubey, Michael B.: *See—*
Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J., 4,107,940, Cl. 62-121.000.

Dubinsky, Rudolf Solomonovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Duff, Edward John, to Colgate-Palmolive Company. Process of preparing materials having calcium and phosphate components. 4,108,980, Cl. 424-52.000.

Dumesnil, Eugene F., Jr., to Tip Top Industries, Inc. Tray having paint transfer roller for pad painters. 4,107,815, Cl. 15-257.050.

Dunlop Limited: *See—*
Bond, Robert, 4,108,230, Cl. 152-210.000.

Dunn, Bruce S., to General Electric Company. Composite body. 4,109,063, Cl. 429-30.000.

Du Pont de Nemours, E. I., and Company: *See—*
Alexander, Samuel Ray, 4,108,772, Cl. 210-64.000.
Anderson, Jerrel Charles, 4,109,052, Cl. 428-409.000.
Chambers, William John; and Foss, Robert Paul, 4,108,839, Cl. 528-270.000.
Clendening, Francis Joseph, Jr.; and Rose, Elva Lincoln, 4,107,828, Cl. 28-254.000.
Copelin, Harry Bugbird, 4,108,869, Cl. 260-340.700.

McIntosh, Colin Leslie, 4,108,626, Cl. 71-76.000.
Sharp, Silas S, 4,109,007, Cl. 424-279.000.
Wolf, Anthony David, 4,108,628, Cl. 71-92.000.
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited. Pharmacologically active compounds. 4,109,003, Cl. 424-273.00R.
Durr, Heinrich; and Haubrich, Lothar, to U.S. Philips Corporation. Guide for a printing head of a printing device. 4,108,297, Cl. 400-354.000.
Duville, Rene Omer: *See—*
Vanassche, Willy Joseph; Philippaerts, Herman Adelbert; Duville, Rene Omer; and Schelfaut, Francois Leon, 4,108,661, Cl. 96-59.000.
Dyer, Robert F.: *See—*
DeAnda, Nicholas; Dyer, Robert F.; and Newbold, Roger A., 4,108,437, Cl. 273-86.00D.
Dynatech Corporation: *See—*
Barger, J. P.; and Holroyd, Joseph A., 4,108,109, Cl. 118-52.000.
E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,109,087, Cl. 544-115.000.
Denzel, Theodor; and Hoehn, Hans, 4,109,091, Cl. 544-250.000.
Gordon, Eric M., 4,109,084, Cl. 544-29.000.
Ondetti, Miguel Angel, 4,108,886, Cl. 260-455.00R.
Sprague, Peter W., 4,108,894, Cl. 260-564.00R.
Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., 4,108,860, Cl. 260-304.00A.
E. Schluter Fachhandel fur Schweisstechnik: *See—*
Schluter, Jurgen, 4,109,131, Cl. 219-137.620.
E. W. Buschman Company, The: *See—*
Vogt, Robert K.; and Heit, Martin A., 4,108,303, Cl. 198-781.000.
Eakes, Marion L., to Marion L. Eakes Company. Ventilating system for industrial machines. 4,108,051, Cl. 115 LH-.
Eastcott, Peter DeH.; and Truman, Peter T., to Canadian General Electric Company, Ltd. Plural rope friction hoist with braking apparatus. 4,108,280, Cl. 187-20.000.
Eastern Bindery, Inc.: *See—*
Coen, Manus; and Bonfield, Joseph, 4,108,473, Cl. 281-29.000.
Eastman Kodak Company: *See—*
Chapman, Derek D., 4,108,667, Cl. 96-131.000.
Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, 4,108,850, Cl. 260-162.000.
Mey, William, 4,108,657, Cl. 96-1.600.
Welch, Richard D.; and Iversen, John E., 4,108,702, Cl. 156-192.000.
Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, to Kontekla Oy. Rain water roof outlet or similar for a building. 4,107,929, Cl. 61-14.000.
Ebonex Corporation: *See—*
Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., 4,108,679, Cl. 106-307.000.
Eckert, Alton B., Jr.; and Gluck, Julius, to Pitney-Bowes, Inc. Developer supply control system in a copier. 4,108,545, Cl. 355-14.000.
Eckhoff, Paul S., to International Minerals & Chemical Corp. Composition process for aqueous base coatings for corrodible metals. 4,108,811, Cl. 260-22.0TN.
Edamura, Mizuo: *See—*
Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, 4,109,157, Cl. 250-531.000.
Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Novel benzopyran derivatives. 4,108,871, Cl. 260-345.200.
Edwards, Alfred Gerald; and Harris, Glyn Islwyn, to Albright & Wilson Ltd. Curable resin compositions. 4,108,822, Cl. 260-32.80R.
Egan, William J., Jr.; and Mazer, Lloyd M., to United Technologies Corporation. Laser combustor apparatus. 4,108,591, Cl. 431-121.000.
Eggermont, Ludwig Desire Johan; Dijkmans, Eise Carel; and Riemens, Karel, to U.S. Philips Corporation. Delta-modulation encoder. 4,109,203, Cl. 325-38.00B.
Egli, Ernst, to Spribag Aktiengesellschaft. Centrifugal slinging apparatus for hot repair of electric furnaces, ladles or the like. 4,108,384, Cl. 239-665.000.
Ehrhardt, Josef; and Winter, Heinrich, to Battelle-Institute. Method of continuous production of a ductile superconducting material in the form of tapes, foils or wires. 4,108,737, Cl. 204-13.000.
Eigenmann, Ludwig. Retroreflective roadway surface marking tape material. 4,108,536, Cl. 350-105.000.
Eiraku, Kunihiro, to Mitsui Mining & Smelting Co., Ltd. Electrically controlled rear-view mirror with two coaxial rocking systems. 4,108,541, Cl. 350-289.000.
Eisenbraun, Ewald: *See—*
Briska, Marian; and Eisenbraun, Ewald, 4,109,030, Cl. 427-93.000.
Eisenhart, Bruce S.: *See—*
Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., 4,109,192, Cl. 320-1.000.
Ejiri, Masakazu: *See—*
Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.
Ekwall, Carl G. B., to Atlas Copco Aktiebolag. Rock drilling apparatus with noise reducing drill rod cover. 4,108,258, Cl. 175-320.000.
Electric Power Research Institute, Inc.: *See—*
Satterthwaite, Dale J., 4,108,615, Cl. 55-2.000.
Wycklendt, Daniel A.; and Hudis, Martin, 4,109,228, Cl. 337-276.000.
Electrolux GmbH: *See—*
Michael, Harald Richard, 4,108,192, Cl. 137-1.000.
Elfes, Lee E.; and Beckerman, Joseph W., to Massey-Ferguson Inc. Coupling. 4,107,951, Cl. 64-14.000.
Eli Lilly and Company: *See—*
Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, 4,109,002, Cl. 424-272.000.
O'Doherty, George O. P., 4,108,631, Cl. 71-103.000.
Elkins, Christopher W.: *See—*
Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., 4,108,167, Cl. 128-66.000.
Ellen, Peter Edington, to Elspan International Limited. Vertically moving slip forms. 4,108,583, Cl. 425-65.000.
Elliott, William J.: *See—*
Fried, Josef; and Elliott, William J., 4,108,870, Cl. 260-340.90R.
Elsasser, A. Frederick: *See—*
Davenport, James D.; Dreikorn, Barry A.; and Elsasser, A. Frederick, 4,109,002, Cl. 424-272.000.
Elspan International Limited: *See—*
Ellen, Peter Edington, 4,108,583, Cl. 425-65.000.
Emerson Electric Co.: *See—*
Pauli, Jude A., 4,109,221, Cl. 335-251.000.
Emerson Electrical Co.: *See—*
Plasko, Emil Robert, 4,109,229, Cl. 337-408.000.
Emery Industries, Inc.: *See—*
Sturwold, Robert Joseph, 4,108,785, Cl. 252-56.00R.
Emken, Michael R.: *See—*
Slivenko, Victor; and Emken, Michael R., 4,108,173, Cl. 128-214.00R.
Empire Oil Tool Company: *See—*
Garrison, Marion A., 4,108,023, Cl. 74-804.000.
Endo, Kiyonobu: *See—*
Goshima, Takeshi; and Endo, Kiyonobu, 4,109,045, Cl. 428-212.000.
Endriz, John Guiry: *See—*
Catanese, Carmen Anthony; Endriz, John Guiry; and Keneman, Scott Allen, 4,109,178, Cl. 315-12.00R.
Cosentino, Louis Salvatore; Endriz, John Guiry; and Stockdale, George Fairbank, 4,109,299, Cl. 361-412.000.
Energy Conservation Devices, Inc.: *See—*
Keeney, Lawrence V., 4,108,375, Cl. 237-8.00R.
Engel, Adalbert. Bobbin for textile yarns or the like. 4,108,396, Cl. 242-118.110.
England, Alfred W.; Krasny, Louis M.; and Narey, Edward F., to Xerox Corporation. Variable field length addressing system having data byte interchange. 4,109,310, Cl. 364-200.000.
England, Will Clarke. Multirotary energy conversion valve. 4,108,198, Cl. 137-194.000.
Engledow, David, to British Steel Corporation. Arc furnace steelmaking. 4,108,633, Cl. 75-11.000.
Ensign, Harold W.; and Zieg, Clifford V., to Cla-Val Co. Fluid operated pinch valve. 4,108,418, Cl. 251-5.000.
Epstein, Joseph; and Davis, George T., to United States of America, Army. Process for preparing organophosphorus and organophosphono fluorines. 4,108,950, Cl. 260-986.000.
Epstein, Joseph: *See—*
Mill, Theodore; Gould, Constance W.; Epstein, Joseph; and Schiff, Leon J., 4,108,746, Cl. 204-158.00R.
Epstein, Robert D. Memorization aids. 4,107,852, Cl. 35-8.00R.
Erdi, George: *See—*
Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, 4,109,215, Cl. 330-254.000.
Erickson, Clifford W., to Honeywell Inc. Proximity sensor. 4,109,233, Cl. 340-15.000.
Eriksson, Gosta Harald: *See—*
Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, 4,108,933, Cl. 264-42.000.
Ernest, Robert P.: *See—*
Hideg, Laszlo; and Ernest, Robert P., 4,108,136, Cl. 123-209.000.
Ernst, Alfred. Durometer according to Rockwell system. 4,107,978, Cl. 73-83.000.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Linear motion ball bearing. 4,108,503, Cl. 308-6.00C.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Raceway for longitudinally movable rolling element bushing. 4,108,504, Cl. 308-6.00C.
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., to Owen-Illinois, Inc. Insulating dielectric for gas discharge device. 4,109,176, Cl. 313-220.000.
Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
Sick, Erwin; and Staimer, Angelika, 4,108,533, Cl. 350-6.700.
Escher Wyss Limited: *See—*
Siegfried, Armin, 4,107,831, Cl. 29-116.0AD.
Eskeli, Michael. Heat pump with two rotors. 4,107,944, Cl. 62-401.000.
Eskeli, Michael. Thermodynamic compressor. 4,107,945, Cl. 62-499.000.
Espinosa, Albert. Portable writing and reading table assembly. 4,108,083, Cl. 108-6.000.
Esposto, Victor, to Frost Enterprises, Inc. Comb for subdividing hair strands. 4,108,186, Cl. 132-124.000.
Estes, John H.; Kravitz, Stanley; and Brandenburg, John T., to Texaco Inc. Method of preparing a reaction chamber. 4,108,218, Cl. 141-1.000.
Estes, Lewis W.; and Johns, Paul W., to Schaffer Company, The. Bead seam construction and method of forming. 4,109,042, Cl. 428-193.000.

Ethyl Corporation: *See—*
Malec, Robert E., 4,108,858, Cl. 260-294.80E.
Etra, Richard Henry. Diver's control and indication apparatus. 4,109,140, Cl. 235-92.0MT.
Ettema, Ernst, to Wavin B.V. Branch piece for providing branch connections in a pipe. 4,108,480, Cl. 285-197.000.
European Rotogravure Association: *See—*
Dini, Mamiliano, 4,108,659, Cl. 96-36.300.
Evans, David F.: *See—*
Yindra, Leonard J.; Evans, David F.; and Klug, Joseph R., 4,108,086, Cl. 108-157.000.
Evans, David Roger, to Sealectro Corporation. Electrical feedthrough devices. 4,108,529, Cl. 339-177.00R.
Evans, John H., to Stant Manufacturing Company, Inc. Locking gas cap with torque override feature. 4,107,961, Cl. 70-165.000.
Evans, Walter J.: *See—*
Hetke, Adolf; and Evans, Walter J., 4,108,637, Cl. 75-53.000.
Evans, Wilbur G.: *See—*
Craig, Gerald; Evans, Wilbur G.; and Potts, Everett L., Jr., 4,109,056, Cl. 428-512.000.
Everett/Charles, Inc.: *See—*
Long, Everett James; and Muench, Elmer W., 4,108,528, Cl. 339-117.00P.
Evers, Robert C., to United States of America. Air Force. Hybrid perfluoroalkylene ether thioimidate ester monomers. 4,108,884, Cl. 260-453.0RW.
Extine, James M., to Raymond Lee Organization, Inc., The. Leveling unit for parked vehicles. 4,108,421, Cl. 254-88.000.
Exxon Production Research Company: *See—*
Mifsud, Joseph F., 4,108,270, Cl. 181-114.000.
Exxon Research & Engineering Co.: *See—*
Foroulis, Zisis Andrew, 4,108,790, Cl. 252-175.000.
Langer, Arthur W., Jr., 4,108,921, Cl. 260-827.000.
Rossi, Albert; and Miller, Harold N., 4,108,612, Cl. 44-62.000.
F. L. Smidth & Co.: *See—*
Christiansen, Soren Bent, 4,108,593, Cl. 432-14.000.
Faani, Siamac: *See—*
Babunovic, Momir; Gender, James R.; Faani, Siamac; and Bulboaca, Mihai A., 4,108,762, Cl. 209-111.70T.
Faber, Kurt Heinrich Albert Erich, to Sandvik Aktiebolag. Boring tool. 4,108,567, Cl. 408-224.000.
Fabry, Gyorgy: *See—*
Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, 4,107,851, Cl. 34-10.000.
Fair, Carl. Igniter for gas fired torches. 4,108,592, Cl. 431-128.000.
Fairman, Stanley W. Cooling system. 4,107,942, Cl. 62-305.000.
Falk, Leonard P.; Stadler, Robert L.; and Alford, James R., to UMC Industries, Inc. Article vendor with elevator. 4,108,333, Cl. 221-13.000.
Fancher, Llewellyn W., to Stauffer Chemical Company. Insecticidal hydrazone phosphates and phosphonates. 4,108,988, Cl. 424-211.000.
Fane, William J.: *See—*
Dietrich, Hagen; Fane, William J.; and Potschka, Joseph, 4,108,482, Cl. 292-165.000.
Farallon Industries, Inc.: *See—*
Hollingsworth, Ashley J.; and Shamlian, Ralph B., 4,107,996, Cl. 73-300.000.
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Thiazolo[3,4-b]isoquinoline derivatives, pharmaceutical compositions containing them and pharmaceutical methods using them. 4,108,999, Cl. 424-258.000.
Farmer, Douglas A., Jr.; and Wojtowicz, John A., to Olin Corporation. Calcium hypochlorite composition containing magnesium and process for making same. 4,108,792, Cl. 252-187.00H.
Farnham, Alford G.: *See—*
Johnson, Robert N.; and Farnham, Alford G., 4,108,837, Cl. 528-126.000.
Farque, Anthony, to Gettig Engineering & Manufacturing Co., Inc. Self-propelled golf cart. 4,109,186, Cl. 318-587.000.
Favale, Anthony George, to Bell Telephone Laboratories, Incorporated. Jumper plug and socket. 4,108,522, Cl. 339-19.000.
Feagin, Frederick E.: *See—*
Genest, Leonard J.; and Feagin, Frederick E., 4,108,366, Cl. 235-450.000.
Federal Signal Corporation: *See—*
Minogue, Robert Willis, 4,108,560, Cl. 403-33.000.
Fehrer, Ernst; Fuchs, Helmut; and Konig, Franz, to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G. Apparatus for spinning textile fibers. 4,107,909, Cl. 57-5.000.
Fein, Michael E.: *See—*
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,109,176, Cl. 313-220.000.
Feingold, Irene B.; and Feingold, Stanley Z. Storage binder. 4,108,307, Cl. 206-387.000.
Feingold, Stanley Z.: *See—*
Feingold, Irene B.; and Feingold, Stanley Z., 4,108,307, Cl. 206-387.000.
Felder, Donald Wayne. Centrifugal air conditioner. 4,107,936, Cl. 62-5.000.
Feldmuhle Aktiengesellschaft: *See—*
Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, 4,109,048, Cl. 428-325.000.
Felstead, E. Barry, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Frequency plane filters for an optical processor for synthetic aperture radar. 4,108,538, Cl. 350-162.0SF.
Felter, John V. Attic fans. 4,108,580, Cl. 417-362.000.
Fenix & Scisson, Inc.: *See—*
Lynch, Paul E., 4,108,478, Cl. 285-82.000.
Fenton, Francis Michael: *See—*
Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, 4,109,113, Cl. 179-99.000.
Ferranti, Limited: *See—*
Peart, Norman Eli, 4,109,220, Cl. 335-212.000.
Ferro Corporation: *See—*
Burgyan, Stephan J., 4,109,054, Cl. 428-433.000.
Fetters, Lewis J.; and Bi, Le-Khac, to University of Akron, The. Star polymers and process for the preparation thereof. 4,108,945, Cl. 260-880.00B.
Feuillade, Georges: *See—*
Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, 4,109,066, Cl. 429-145.000.
Fiat-Allis Macchine Movimento Terra S.p.A.: *See—*
Bifani, Alberto Giovanni; and Bertolino, Giorgio Maria, 4,108,317, Cl. 214-1.0PA.
Fiat Societa per Azioni: *See—*
Sarti, Vincenzo; Bertone, Antonino; and Rivetti, Enrico, 4,108,273, Cl. 180-148.000.
Fidler, Fred; and Holt, Joseph C., to Metal Box Limited. Method and apparatus for forming a coated container. 4,108,099, Cl. 113-120.00A.
Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, to Eastman Kodak Company. Positive-working immobile photographic azo compounds. 4,108,850, Cl. 260-162.000.
Fields, Ellis K., to Standard Oil Company a corporation of Indiana. Tricycloundecene-1,2,3,4,9,9-hexahal-5,6-diacyl compounds. 4,108,864, Cl. 260-326.00C.
Finch, Reginald Vernon. Vortex reducing wing tip. 4,108,403, Cl. 244-199.000.
Fink, Richard H., to Campbell Chain Company. Coupling link locking assembly. 4,107,917, Cl. 59-85.000.
Fink, Robert. Child's shelf and garment hanger rack. 4,108,084, Cl. 108-29.000.
Firestone Tire & Rubber Company, The: *See—*
Bohm, Georg Gustav Anton; Trivedi, Prakash Druman; and Valaitis, Joseph Kestutis, 4,108,749, Cl. 204-159.170.
Fisher Controls Company: *See—*
Luthe, Fred J.; and Hays, Allen E., 4,108,210, Cl. 138-42.000.
Fisher, Walter, to Borg-Warner Corporation. Hydraulic torque converter lock-up clutch. 4,108,290, Cl. 192-3.300.
Fishwick, Brian Ribbons: *See—*
Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.
Fisk, Bernard C.: *See—*
Donohue, James M.; and Fisk, Bernard C., 4,109,313, Cl. 364-518.000.
Fisons Limited: *See—*
Percival, Albert, 4,109,004, Cl. 424-273.00R.
Fitzpatrick, Michael D.: *See—*
Cricchi, James R.; and Fitzpatrick, Michael D., 4,109,163, Cl. 307-205.000.
Fives-Cail Babcock: *See—*
Chielens, Alain; Marchal, Gerard; and Gesquiere, Michel, 4,108,410, Cl. 248-130.000.
Flanagan, Paul: *See—*
Searight, Edward F.; and Flanagan, Paul, 4,108,242, Cl. 165-164.000.
Fleck, Fritz; and Heller, Juerg, to Sandoz Ltd. Divinyl stilbenes as optical brighteners. 4,108,887, Cl. 260-465.00H.
Fleckenstein, Wolfgang; and Thiemann, Volker, to Dragerwerk Aktiengesellschaft. Puncture probe for measuring heat transfer or blood circulation of living tissues. 4,108,163, Cl. 128-2.00H.
Fleer, Ernst-Otto; and Heubeck, Erich, to Siemens Aktiengesellschaft. Device for supplying cooling agents to a dental instrument of a handpiece. 4,107,846, Cl. 32-27.000.
Fleet, Bernard; and Das Gupta, Sankar, to Ontario Limited. Carbon fiber electrode. 4,108,754, Cl. 204-263.000.
Fleet, Bernard; and Das Gupta, Sankar, to Ontario Limited. Metallic filament electrode. 4,108,755, Cl. 204-263.000.
Fleet, Bernard; and Das Gupta, Sankar, to 308489 Ontario Limited. Carbon fiber electrode. 4,108,757, Cl. 204-294.000.
Fleischer, Henry. Coupling device. 4,108,475, Cl. 285-15.000.
Fleischmann, Horst, to Gebruder Kommerling Kunststoffwerke GmbH. Arrangement for supporting a railing and the like. 4,108,422, Cl. 256-67.000.
Fleischmann, Reinhold; and Schach, Erich. Steering wheel cover. 4,108,020, Cl. 74-558.000.
Fleming, Robert W.: *See—*
Miller, Laird F.; and Fleming, Robert W., 4,108,896, Cl. 260-570.50C.
Flemings, Merton C.; Riek, Rodney G.; and Young, Kenneth P., to Massachusetts Institute of Technology. Method for forming high fraction solid metal compositions and composition therefor. 4,108,643, Cl. 75-135.000.
Fletchic, Donald K.: *See—*
Baer, Ralph H.; and Fletchic, Donald K., 4,109,114, Cl. 179-100.40D.
Floreancig, Antoine: *See—*
Cuer, Jean-Pierre; and Floreancig, Antoine, 4,108,963, Cl. 423-321.00S.
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., to

Texaco Inc. Pipeline method for transporting viscous hydrocarbons. 4,108,193, Cl. 137-13.000.

Focke, Heinz; and Balmer, Oskar, to Focke & Pfuhl. Method and apparatus having a vibration-free measuring phase for automatically weighing bulk material, more particularly tobacco. 4,108,263, Cl. 177-145.000.

Focke & Pfuhl: *See—*
Focke, Heinz; and Balmer, Oskar, 4,108,263, Cl. 177-145.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Carton with integral removable card. 4,108,350, Cl. 229-37.00R.

Ford Motor Company: *See—*
Hetke, Adolf; and Evans, Walter J., 4,108,637, Cl. 75-53.000.
Hideg, Laszlo; and Ernest, Robert P., 4,108,136, Cl. 123-209.000.
Minck, Robert W., 4,108,743, Cl. 204-64.00R.
Moskowitz, David, 4,108,649, Cl. 75-203.000.

Foreman, Arthur L.: *See—*
Mason, John Richard; and Foreman, Arthur L., 4,109,294, Cl. 361-399.000.

Forenade Fabriksverken: *See—*
Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.

Formica Corporation: *See—*
DeLapp, Darwin Fiske, 4,109,043, Cl. 428-206.000.

Formistor Corporation: *See—*
Westberg, John Kellogg, II, 4,108,217, Cl. 140-105.000.

Foroulis, Zisis Andrew, to Exxon Research & Engineering Co. Corrosion inhibitor. 4,108,790, Cl. 252-175.000.

Fortini, Anthony; and Kazaroff, John M., to United States of America, National Aeronautics and Space Administration. Heat exchanger and method of making. 4,108,241, Cl. 165-146.000.

Fortuin, Michael Stanley: *See—*
Caunt, Anthony David; Fortuin, Michael Stanley; and Williams, Ian Gabriel, 4,108,796, Cl. 252-429.00B.

Foss, Robert Paul: *See—*
Chambers, William John; and Foss, Robert Paul, 4,108,839, Cl. 528-270.000.

Foster Wheeler Energy Corporation: *See—*
Bengtson, Robert W., 4,108,356, Cl. 235-69.000.
Trozzi, Norman Kenneth, 4,108,301, Cl. 198-633.000.

Foundry Technology, Inc.: *See—*
McMullen, Carl R.; and Schlageter, Gary M., 4,108,188, Cl. 134-57.00R.

Fournex, Robert: *See—*
Poittevin, Andre; Derible, Pierre Henri; and Fournex, Robert, 4,108,994, Cl. 424-250.000.

Fraas, Lewis M.: *See—*
Zanio, Kenneth W.; and Fraas, Lewis M., 4,108,684, Cl. 136-89.0TF.

Francis, Brian G.: *See—*
Francis, James A.; Francis, Brian G.; and Francis, Frederick L., 4,108,927, Cl. 264-13.000.

Francis, Frederick L.: *See—*
Francis, James A.; Francis, Brian G.; and Francis, Frederick L., 4,108,927, Cl. 264-13.000.

Francis, James A.; Francis, Brian G.; and Francis, Frederick L. Method of making lead shot. 4,108,927, Cl. 264-13.000.

Frank, Pierre: *See—*
Arsac, Aime Joseph; and Frank, Pierre, 4,109,093, Cl. 548-334.000.

Franke, Kurt; Seissl, Johannes; and Stuermer, Wilhelm, to Siemens Aktiengesellschaft. Package for intraoral dental X-ray films. 4,108,308, Cl. 206-455.000.

Frankiw, Walter, to Lear Siegler, Inc. Gear crowning machine cam. 4,108,047, Cl. 90-1.60R.

Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, to HI-G Incorporated. Relay and RF adaptor assembly. 4,109,222, Cl. 335-301.000.

Frantz, Virgil L., to Graham-White Sales Corp. Dual filter assembly. 4,108,617, Cl. 55-162.000.

Frech, Kenneth J.: *See—*
Hoppstock, Frederic H.; and Frech, Kenneth J., 4,108,918, Cl. 260-680.00E.
Hoppstock, Frederic H.; and Frech, Kenneth J., 4,108,919, Cl. 260-680.00E.
Spoerke, Roger W.; and Frech, Kenneth J., 4,108,913, Cl. 260-669.00R.

Fredrickson, Donald M., to Moore Business Forms, Inc. Rub-on security cards. 4,109,047, Cl. 428-307.000.

Freezing Equipment Sales, Inc.: *See—*
Schneider, Anthony C., 4,108,618, Cl. 55-178.000.

Freimuth, Gerhart William; and Weiner, Jerold Samuel, to Gerhart Engineering & Machine Co. Container filling machine. 4,108,221, Cl. 141-146.000.

Fresard, Marcel, to Mefina S.A. Zig-zag sewing machine. 4,108,092, Cl. 112-158.00R.

Fresnel, Philippe: *See—*
Tramier, Bernard; Delourme, Raymond; and Fresnel, Philippe, 4,108,866, Cl. 260-329.00R.

Frey, Sydney W., Jr., to Allen-Bradley Company. Compact electrical control. 4,109,230, Cl. 338-164.000.

Fried, Josef; and Elliott, William J., to University of Chicago. Stereocontrolled synthesis of α-multistriatin. 4,108,870, Cl. 260-340.90R.

Friedlander, Charles B., to PPG Industries, Inc. Urea-urethane-acrylate radiation curable coating compositions and methods of making same. 4,108,840, Cl. 528-46.000.

Friedrich, Rainer: *See—*
Schuelein, Rolf G.; and Friedrich, Rainer, 4,107,809, Cl. 15-42.000.

Fries, Paul, to Siemens Aktiengesellschaft. Heat pipe. 4,108,239, Cl. 165-105.000.

Frito-Lay, Inc.: *See—*
Bembenek, William E., 4,108,033, Cl. 83-122.000.

Fritsch, Rudolph Paul, to C.F. Scheer & Cie. Apparatus for processing molten liquid plastics, particularly for extrusion of plastics. 4,108,588, Cl. 425-185.000.

Fritz Eichenauer, Firma: *See—*
Ohnmacht, Helmut, 4,109,138, Cl. 219-364.000.

Froehlich, Helmut H., to Milliken Research Corporation. Cleaning composition. 4,108,800, Cl. 252-541.000.

Frost Enterprises, Inc.: *See—*
Esposto, Victor, 4,108,186, Cl. 132-124.000.

Frost, Kenneth A., Jr., to Chevron Research Company. Pour point depressants. 4,108,613, Cl. 44-62.000.

Froyd, Stanley G.; Ue, Raymond C.; and Buchanan, John Paul, to McDonnell Douglas Corporation. Servo system employing digital components. 4,109,185, Cl. 318-571.000.

Frungel, Frank. Apparatus and method for case hardening steel tools by application of heating pulses. 4,109,127, Cl. 219-7.500.

Fuchigami, Masao, to Kabushiki Kaisha Komatsu Seisakusho. Variable-force vibrator. 4,108,009, Cl. 74-61.000.

Fuchs, Helmut: *See—*
Fehrer, Ernst; Fuchs, Helmut; and Konig, Franz, 4,107,909, Cl. 57-5.000.

Fuji Electric Co., Ltd.: *See—*
Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, 4,108,288, Cl. 191-49.000.

Fuji Photo Film Co., Ltd.: *See—*
Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, 4,109,260, Cl. 354-106.000.
Hayashi, Katsumi; Iijima, Yoo; and Okutsu, Eiichi, 4,108,662, Cl. 96-66.500.
Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, 4,108,787, Cl. 252-62.560.
Ohnishi, Masahiro, 4,109,256, Cl. 354-4.000.
Tadokoro, Eiichi; and Kitamoto, Tatsuji, 4,108,739, Cl. 204-40.000.
Tanaka, Mitsugu; Okazaki, Masaki; Aono, Toshiaki; and Hirose, Takeshi, 4,108,663, Cl. 96-74.000.

Fuji Photo Optical Co., Ltd.: *See—*
Tanaka, Hitoshi, 4,108,211, Cl. 138-120.000.

Fujii, Hiromu: *See—*
Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, 4,108,694, Cl. 148-31.550.

Fujikura, Takashi: *See—*
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

Fujimori, Noboru: *See—*
Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eiichi; and Ishikawa, Hidehiko, 4,108,668, Cl. 96-135.000.

Fujimoto, Iwao: *See—*
Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.

Fujimura, Sadao: *See—*
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,108,155, Cl. 126-270.000.

Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, to Nisshin Steel Company, Limited. Oxidation-resisting austenitic stainless steel. 4,108,641, Cl. 75-124.000.

Fujisawa, Kei-ichi: *See—*
Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, 4,108,725, Cl. 195-96.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kishi, Yoshito; Nakatsuka, Shinichi; and Tanino, Hideo, 4,108,861, Cl. 260-306.70C.

Fujita, Masahiko; Gotoh, Toshihiko; and Hagino, Hiroshi, to Hitachi, Ltd.; and Japan Servo Co., Ltd. Electric motor having frequency generator. 4,109,170, Cl. 310-68.00R.

Fujita, Ryuzo: *See—*
Kimura, Kazuo; Hirano, Masao; Sugita, Isao; and Fujita, Ryuzo, 4,108,947, Cl. 260-889.000.

Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, to Fuji Photo Film Co., Ltd. Superimposing device for use in a data-recording camera. 4,109,260, Cl. 354-106.000.

Fujitsu Limited: *See—*
Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,109,181, Cl. 315-169.0TV.
Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, 4,108,364, Cl. 235-419.000.

Fujiwara, Kohichi: *See—*
Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, 4,108,694, Cl. 148-31.550.

Fujiwara, Tsuyoshi: *See—*
Kanazashi, Tetsuo; and Fujiwara, Tsuyoshi, 4,109,281, Cl. 358-114.000.

Fukui, Yutaka: *See—*
Urai, Muneharu; Goto, Shuichi; and Fukui, Yutaka, 4,107,829, Cl. 29-91.100.

Fukuto, Tetsuo Roy; and Black, Allan Lindsay, to University of California, The Regents of the. N-aminosulfenyl derivatives of aldicarb. 4,108,991, Cl. 424-248.500.

Fukuyama, Seiji: *See*—
Mitsui, Murao; Yokogawa, Kiyoshi; and Fukuyama, Seiji, 4,107,982, Cl. 73-95.000.
Funk, Friedrich. Colloidal mill. 4,108,385, Cl. 241-46.040.
Furler, Alan George: *See*—
Tenkman, Robert Henry; Furler, Alan George; and McGinnis, Edward F., Jr., 4,109,223, Cl. 336-84.00C.
Furstenberg, Joachim; and Hencke, Dietmar, to LTG Lufttechnische GmbH. Double twisting machine. 4,107,910, Cl. 57-34.00R.
Furukawa, Mitsuhiko: *See*—
Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.
Furuoya, Itsuo: *See*—
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Furusawa, Yoshikatsu. Device for indicating the direction of driving of a vehicle. 4,109,171, Cl. 310-75.00C.
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, to Cime Bocuze. Process for the preparation of molybdenum based alloys with solid reinforcing elements by sintering. 4,108,650, Cl. 75-206.000.
Futamase, Tsuyoshi: *See*—
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Futurecraft Corporation: *See*—
Piet, Meyer; and Giles, Dean Gaylord, 4,108,509, Cl. 312-1.000.
G.A.L. Manufacturing Corporation: *See*—
Glaser, Walter G., 4,108,281, Cl. 187-29.00R.
G. D. Searle & Co.: *See*—
Brown, Edward A.; and Colton, Frank B., 4,108,851, Cl. 260-239.570.
GAF Corporation: *See*—
de Boer, Henri G. J.; van der Breggen, Gerrit; and Wemmers, Anton, 4,108,664, Cl. 96-75.000.
Gagarin, Gregory G., to Knorr-Bremse GmbH. Brake disc for an axle of a railway vehicle. 4,108,286, Cl. 188-218.0XL.
Gagnon, Ronald A.: *See*—
Claussen, Donald F.; and Gagnon, Ronald A., 4,109,305, Cl. 362-418.000.
Gale, Michael Thomas; and Kane, James, to RCA Corporation. Fabrication of diffractive subtractive filter embossing master. 4,108,660, Cl. 96-38.200.
Gallagher, James C., to APSEE, Incorporated. Means for generating a negative charge. 4,109,290, Cl. 361-231.000.
Gallagher, Joseph P.: *See*—
Crane, Robert L.; Grandt, Alten F., Jr.; and Gallagher, Joseph P., 4,107,980, Cl. 73-88.00R.
Gander, Robert J.; and Gurney, John A., to Johnson & Johnson. Esters of retinoic acid. 4,108,880, Cl. 260-410.500.
Ganellin, Charon Robin: *See*—
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,109,003, Cl. 424-273.00R.
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Garkaljuk, Rodimir Ivanovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
Garn, Dieter: *See*—
Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, 4,108,054, Cl. 99-348.000.
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., to ACF Industries, Incorporated. Railway car truck and side bearing assembly. 4,108,080, Cl. 105-199.0CB.
Garrett, Dale. Camper steps. 4,108,457, Cl. 280-166.000.
Garrison, Marion A., to Empire Oil Tool Company. Gear system. 4,108,023, Cl. 74-804.000.
Gatzek, Leo E. Rivet making method and rivet. 4,107,805, Cl. 10-27.00R.
Gauss, Wilhelm; Van Logten, Henrious; and Kruger, Arthur, to Brueninghaus Hydraulik GmbH. Axial piston pump or pumping machine. 4,108,048, Cl. 91-6.500.
Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, to Ayerst, McKenna & Harrison Limited. Diuretic [2]benzopyrano[4,3-b]pyridines and process therefor. 4,108,997, Cl. 424-256.000.
Gearhart-Owen Industries, Inc.: *See*—
King, David W.; and Rankin, Emmitt Edward, 4,108,243, Cl. 166-66.000.
Gebruder Kommerling Kunststoffwerke GmbH: *See*—
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Gedessaud, Robert: *See*—
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Hain, Gottfried; Dohle, Gunter; Geist, Josef; and Schmidt, Rainer, 4,108,057, Cl. 99-452.000.
Geisthoff, Hubert, to Jean Walterscheid GmbH. Protective guard assembly for a universal joint. 4,107,952, Cl. 64-32.00F.
Gelbein, Abraham P.: *See*—
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Gender, James R.: *See*—
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General Atomic Company: *See*—
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Slivenko, Victor, 4,108,174, Cl. 128-214.00R.
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Weisz, Thomas Anthony, 4,108,713, Cl. 156-499.000.
General Electric Company: *See*—
Balchunas, Charles A., 4,109,136, Cl. 219-252.000.
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Chalk, Alan J.; and Gilbert, Alfred R., 4,108,942, Cl. 260-875.000.
Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., 4,108,685, Cl. 148-1.500.
Coggiola, James P., 4,107,860, Cl. 38-77.830.
Crivello, James V., 4,108,747, Cl. 204-159.180.
Dunn, Bruce S., 4,109,063, Cl. 429-30.000.
Hatch, Burton D., 4,108,616, Cl. 55-48.000.
Huseby, Irvin C.; and Klug, Frederic J., 4,108,676, Cl. 106-65.000.
Kincaid, Thomas G.; and Stutt, Charles A., 4,109,204, Cl. 325-38.00R.
Klug, Frederic J.; and Pasco, Wayne D., 4,108,672, Cl. 106-38.900.
Knight, J. Nelson; and Turner, Roger C., 4,107,833, Cl. 29-460.000.
Lee, Gim Fun, Jr., 4,108,925, Cl. 260-876.00R.
Love, William D.; and Hueschen, Robert E., 4,109,058, Cl. 428-553.000.
Mark, Victor; and Wilson, Phillip Steven, 4,108,820, Cl. 260-30.80R.
Mark, Victor; and Wilson, Phillip Steven, 4,108,821, Cl. 260-30.80R.
McNaughton, Lawrence S., 4,109,190, Cl. 318-609.000.
Mehan, Richard L.; and Morelock, Charles R., 4,109,050, Cl. 428-332.000.
Prochazka, Svante; and Dondalski, William J., 4,108,929, Cl. 264-29.100.
Reynolds, Howard, 4,108,531, Cl. 339-258.00F.
Ringwall, Carl G., 4,107,990, Cl. 73-194.00B.
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Will, Fritz G.; and Secor, Fay W., 4,109,065, Cl. 429-105.000.
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General Signal Corporation: *See*—
Budrys, Ignas; and Right, Robert W., 4,109,246, Cl. 340-518.000.
Hutchings, William F., 4,109,318, Cl. 366-140.000.
Genest, Leonard J.; and Feagin, Frederick E., to Monitron Industries, Inc. Apparatus for providing and sensing coded information. 4,108,366, Cl. 235-450.000.
Gennone, Richard J.; and Sturdevant, Robert D., to Kawecki Berylco Industries, Inc. Strontium-bearing master composition for addition to eutectic and hypo-eutectic silicon-aluminum casting alloys. 4,108,646, Cl. 75-148.000.
George, Robert Jay. Water jacketed cylinder. 4,108,118, Cl. 123-41.570.
Georgia-Pacific Corporation: *See*—
Bornstein, L. F., 4,108,226, Cl. 144-327.000.
Cooper, William D., 4,108,767, Cl. 210-42.00S.
Georgia Tech Research Institute: *See*—
Carstens, Marion R.; and Bates, Homer J., 4,108,079, Cl. 104-252.000.
Gerber, Donald Joel, to Koppers Company, Inc. High efficiency coke oven regenerator checker brick. 4,108,733, Cl. 202-267.00A.
Gerhart Engineering & Machine Co.: *See*—
Freimuth, Gerhart William; and Weiner, Jerold Samuel, 4,108,221, Cl. 141-146.000.
Gerkens, Roger: *See*—
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Gerlach, Albrecht; Holzmann, Dieter; Mlynek, Daniel; and Hoffmeister, Dirk, to ITT Industries, Incorporated. Method of generating a variable train of pulses. 4,109,210, Cl. 328-61.000.
Gesquiere, Michel: *See*—
Chielens, Alain; Marchal, Gerard; and Gesquiere, Michel, 4,108,410, Cl. 248-130.000.
Gettig Engineering & Manufacturing Co., Inc.: *See*—
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Gewartowski, Steve A., to UOP Inc. Aromatic hydrocarbon alkylation process. 4,108,914, Cl. 260-671.00R.
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Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, 4,108,054, Cl. 99-348.000.
Gibson, Preston H. Light assembly and flasher circuit. 4,108,405, Cl. 246-125.000.
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Giles, Dean Gaylord: *See*—
Piet, Meyer; and Giles, Dean Gaylord, 4,108,509, Cl. 312-1.000.
Gilliom, John W.; and McFarland, Robert H., to Tappan Company, The. Convection oven. 4,108,139, Cl. 126-21.00A.

Gingell, Michael John, to International Standard Electric Corporation. Digital-to-analog converter. 4,109,110, Cl. 179-15.0AP.

Girling Limited: *See—*
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Glaser, Walter G., to G.A.L. Manufacturing Corporation. Elevator door tampering protection system. 4,108,281, Cl. 187-29.00R.

Glasl, Andreas; and Murrmann, Helmuth, to Siemens Aktiengesellschaft. Contact electrode for semiconductor component. 4,109,273, Cl. 357-35.000.

Gleason, John G.; Holden, Kenneth G.; and Yim, Nelson C. F., to SmithKline Corporation. Process for preparing substituted glycines. 4,108,854, Cl. 260-252.000.

Gliemeroth, Georg, to Jenaer Glaswerk Schott & Gen. Phototropic optical glass. 4,108,674, Cl. 106-53.000.

Gluck, Julius: *See—*
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Godart, Pierre: *See—*
L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, 4,108,693, Cl. 148-16.500.

Goddard, Terrence P., to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc. Novel triaminoguanidine nitrate propellants. 4,108,697, Cl. 149-19.300.

Godfrey, Richard Hugh; and Morrell, Albert Maxwell, to RCA Corporation. Cathode-ray tube having apertured mask. 4,109,177, Cl. 313-402.000.

Godfroid, Marcel; and Gerkens, Roger, to Solvay & Cie. Process for the stabilization of methylene chloride. 4,108,910, Cl. 260-652.50R.

Goettert, Edward: *See—*
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Goldammer, Georg: *See—*
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Golden, Theodore Alan. Bendable thermal pack unit. 4,108,146, Cl. 128-400.000.

Goldenberg, Marvin M.: *See—*
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Wright, George C.; and Goldenberg, Marvin M., 4,108,872, Cl. 260-345.200.
Wright, George C.; and Goldenberg, Marvin M., 4,108,873, Cl. 260-345.200.

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Goldsmith, James R.: *See—*
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Goldstein, Leonard; and Yashin, Michael. Work platform. 4,108,277, Cl. 182-82.000.

Gomes, Gilbert Stephen: *See—*
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Gonsalves, Mathew W.; and Murillo, Carlos P., to Gonsalves, Santucci, Inc. Foundation system. 4,107,889, Cl. 52-259.000.

Gonsalves, Santucci, Inc.: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
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Cottman, Kirkwood S., 4,108,831, Cl. 260-45.95C.
Gregg, Michael John William; and Bell, David, 4,108,011, Cl. 74-229.000.
Herman, Eugene T., 4,108,229, Cl. 152-175.000.
Hoppstock, Frederic H.; and Frech, Kenneth J., 4,108,918, Cl. 260-680.00E.
Hoppstock, Frederic H.; and Frech, Kenneth J., 4,108,919, Cl. 260-680.00E.
Kline, Richard H., 4,108,830, Cl. 260-45.85S.
Mast, William C.; Bauer, Richard G.; and Wathen, Tom M., 4,108,923, Cl. 260-836.000.
Simpson, Robert O., 4,108,232, Cl. 152-365.000.
Spoerke, Roger W.; and Frech, Kenneth J., 4,108,913, Cl. 260-669.00R.
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Goranson, Paul L.: *See—*
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Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, to Internationella Siporex AB. Method of manufacturing steam-cured porous concrete products. 4,108,933, Cl. 264-42.000.

Gordon, Eric M., to E. R. Squibb & Sons, Inc. Thiooxime cephalosporin derivatives. 4,109,084, Cl. 544-29.000.

Gordon, Phillip B., Jr.; and Hunt, Keats E., to Caterpillar Tractor Co. Ebullient cooled turbocharger bearing housing. 4,107,927, Cl. 60-605.000.

Goren, Robert N., to Xerox Corporation. Color electrophotographic process employing a document screen. 4,108,654, Cl. 96-1.200.

Gorfien, Harold; Rahman, Abdul R.; and Westcott, Donald E., to United States of America, Army. Method of producing crisp reheated french fried potatoes. 4,109,020, Cl. 426-241.000.

Gorniak, Jerry. Solar energy collector. 4,108,157, Cl. 126-271.000.

Gort, Alfred Frans; and Moore, Charles E., to Hewlett-Packard Company. Reflecting lens system. 4,108,539, Cl. 350-201.000.

Goserud, Dean L. Clamping device. 4,108,413, Cl. 248-214.000.

Goshima, Takeshi; and Endo, Kiyonobu, to Canon Kabushiki Kaisha. Information recording medium. 4,109,045, Cl. 428-212.000.

Gotham, Robert W.: *See—*
McKnight, Robert J.; Neuwirth, Frank J.; and Gotham, Robert W., 4,108,304, Cl. 198-781.000.

Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, to Hitachi, Ltd. Control system for hydroelectric power station system. 4,109,160, Cl. 290-52.000.

Goto, Shuichi: *See—*
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Gotoh, Toshihiko: *See—*
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Gotschy, Friedrich: *See—*
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Gould, Constance W.: *See—*
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Gozzo, Franco: *See—*
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Grabb, William C. Access-limiting apparatus. 4,107,967, Cl. 70-427.000.

Graf, Carl P., to Honeywell Inc. Apparatus being controlled by movement of the eye. 4,109,145, Cl. 250-201.000.

Graham, Robert Malcolm, to United States Pipe and Foundry Company. Gasketed pipe joint. 4,108,481, Cl. 285-231.000.

Graham-White Sales Corp.: *See—*
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Grain, Claude: *See—*
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Grampp, Ekkehard; Schmitt, Reinhold; and Urlaub, Reinhold, to Rohm GmbH. Method for clarification of fruit juice. 4,109,017, Cl. 426-51.000.

Grandrud, Merlin Howard: *See—*
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Grandt, Alten F., Jr.: *See—*
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Grant, Everett A., Sr. Outlet box fastener. 4,108,414, Cl. 248-300.000.

Graubremse GmbH: *See—*
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Gravel, Mark William: *See—*
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Gray, J. Malcolm: *See—*
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Green, George Edward; and Waterhouse, John Sidney. Photopolymerizable epoxy resins containing pendant unsaturated ester or amidomethyl groups. 4,108,803, Cl. 96-76.00R.

Greenbaum, George. Inverted V channel culture. 4,107,876, Cl. 47-79.000.

Greer Hydraulics, Inc.: *See—*
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Gregg, Michael John William; and Bell, David, to Goodyear Tire & Rubber Company, The. Synchronous drive belt and pulley configuration therefor. 4,108,011, Cl. 74-229.000.

Gregoire, Jean-Francois: *See—*
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Gregory, Wallace D.; and Moore, James R., to Milliken Research Corporation. Scrim machine. 4,108,708, Cl. 156-441.000.

Gresham, Lucius C., Jr., to Henderson Clay Products, Inc. Apparatus for forming irregular shaped brick. 4,108,586, Cl. 425-89.000.

Griffin, Phil Harmon: *See—*
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,108,619, Cl. 55-192.000.

Grill, Benjamin: *See—*
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Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, to Klinge Pharma GmbH & Co. Substituted propanol-(2) derivatives of hydroxamic acids and the use thereof as hypolipemic drugs. 4,109,013, Cl. 424-315.000.

Grimm, Robert A.: *See*—
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Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich. Method of checking the valves of aerosol containers for tightness and an apparatus for effecting the same. 4,107,977, Cl. 73-45.300.

Griswold, George G., to Peter Eckrich and Sons, Inc. Slice ejector for slicing machines. 4,108,030, Cl. 83-77.000.

Grocke, Diethelm W. K.; and Jager, Wilfried, to NUTRO Patentverwertungs- und Maschinenhandels GmbH. Process and arrangement for the removal of the packing from packed objects. 4,107,905, Cl. 53-3.000.

Gross, Helmut; and Klundt, Kurt, to Pfaff Industriemaschinen G.m.b.H. Device on a sewing machine for severing thread chains. 4,108,097, Cl. 112-287.000.

Grosselfinger, Horst: *See*—
Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.

Groutage, Frederick D.; and Borunda, Gabriel S., to United States of America, Navy. Dual mode guidance system. 4,108,400, Cl. 244-3.150.

Grueninger, Erwin, to Sandoz Ltd. Aqueous printing inks. 4,108,812, Cl. 260-24.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Reimer, William A., 4,109,300, Cl. 361-415.000.

GTE Sylvania Incorporated: *See*—
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Guiomard, Claude: *See*—
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Gulf Research & Development Company: *See*—
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Gulf & Western Manufacturing Company: *See*—
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Gunderman, Roland E.: *See*—
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Gundersen, Charles R.: *See*—
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Gurbst, Herbert S.: *See*—
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Gurney, John A.: *See*—
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Gutierrez, Enrique H.: *See*—
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Gutman, Gustav; and Goettert, Edward, to Minnesota Mining and Manufacturing Company. Stabilizers for photothermographic constructions. 4,108,665, Cl. 96-114.100.

Guttinger, Peter, to Ruti Machinery Works Ltd. Method and apparatus for a weaving machine for forming a fabric selvedge. 4,108,213, Cl. 139-54.000.

Gutzschebauch, Claus: *See*—
Ploger, Walter; and Gutzschebauch, Claus, 4,108,961, Cl. 423-265.000.
Ploger, Walter; and Gutzschebauch, Claus, 4,108,962, Cl. 423-265.000.

Guyray Industries, Inc. (Entire): *See*—
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Gyromat Corporation, The: *See*—
Wiggins, Richard F., 4,108,105, Cl. 118-2.000.

H. W. Andersen Products Inc.: *See*—
Andersen, Harold Willids; and Harrison, Charles H., 4,107,976, Cl. 73-52.000.

Habermeier, Jurgen; and Buxbaum, Lothar, to Ciba-Geigy Corporation. Thermoplastic polyesters and processes for their manufacture. 4,108,841, Cl. 528-289.000.

Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, to Konishiroku Photo Industry Co., Ltd. Method for hardening gelatin. 4,108,848, Cl. 260-117.000.

Hacker, Morris; and Padilla, Dominick, to RMS Electronics, Inc. Antenna mount attached to vehicle trunk interior. 4,109,252, Cl. 343-715.000.

Hadl, Clyde F.; and Harmon, Shepard L., to Owens-Illinois, Inc. Bottle operated label feed switch mechanism. 4,108,705, Cl. 156-355.000.

Haffer, Gregor: *See*—
Eder, Ulrich; Sauer, Gerhard; Haffer, Gregor; Ruppert, Jurgen; and Wiechert, Rudolf, 4,108,871, Cl. 260-345.200.

Hagino, Hiroshi: *See*—
Fujita, Masahiko; Gotoh, Toshihiko; and Hagino, Hiroshi, 4,109,170, Cl. 310-68.00R.

Hahn, James R., to Dow Corning Corporation. Silacyclopentyl-bis-epsilon-caprolactam. 4,108,832, Cl. 528-32.000.

Hahn, Robert E.: *See*—
Hemming, Donald C.; Hahn, Robert E.; and Robinson, John W., Jr., 4,108,596, Cl. 8-94.270.

Hain, Gottfried; Dohle, Gunter; Geist, Josef; and Schmidt, Rainer, to Alpma Alpenland Maschinenbau Hain and Co. K.G. Device for continuous production of cheese material. 4,108,057, Cl. 99-452.000.

Hajek, Manfred: *See*—
Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, 4,108,842, Cl. 528-61.000.

Hajos, Zoltan George; and Parrish, David Richard, to Hoffmann-La Roche Inc. Asymmetric synthesis of organic compounds. 4,108,898, Cl. 260-586.00C.

Hakeem, Timothy M.: *See*—
Barnich, Richard G.; and Hakeem, Timothy M., 4,109,244, Cl. 340-324.0AD.

Halbach & Braun: *See*—
Braun, Ernst; and Braun, Gert, 4,107,931, Cl. 61-45.00D.

Halbeck, Werner B., to Cutler-Hammer, Inc. Conductive coating on switch lever seal for RFI elimination. 4,109,126, Cl. 200-302.000.

Hales, Richard Harold, to Becton, Dickinson and Company. Radioimmunoassay system. 4,108,975, Cl. 424-1.000.

Hall, Henry W., Sr. Standard bending profile jacket. 4,108,164, Cl. 128-25.000.

Hall, James R.: *See*—
Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., 4,109,192, Cl. 320-1.000.

Hall, Leonard F.; and Noreen, Robert A., to Nelson Industries, Inc. Vent silencer. 4,108,276, Cl. 181-256.000.

Halliburton Company: *See*—
Carney, Leroy L., 4,108,779, Cl. 252-8.50P.
Lawson, Michael B.; and Snyder, Kenneth J., 4,108,681, Cl. 134-20.000.

Halm Instrument Co., Inc.: *See*—
Lyon, Floyd A.; and Harrison, Henry, 4,108,374, Cl. 237-1.00A.

Hamada, Toshimitsu: *See*—
Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.

Hamada, Yoichi: *See*—
Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, 4,109,260, Cl. 354-106.000.

Hamilton, James M.: *See*—
Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., 4,109,192, Cl. 320-1.000.

Hamilton, Stuart R. Environmental control system. 4,107,941, Cl. 62-186.000.

Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, to BASF Aktiengesellschaft. Flexible multi-layer magnetic recording media. 4,109,046, Cl. 428-216.000.

Hammonds, James C.: *See*—
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,108,080, Cl. 105-199.0CB.

Handa, Ryoji: *See*—
Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, 4,108,946, Cl. 260-881.000.

Hane, Toshihide: *See*—
Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, 4,109,143, Cl. 235-462.000.

Hanle, Edgar; and Piech, Ferdinand, to Audi Nsu Auto Union AG. Electrically heated rear window for automotive vehicles. 4,109,133, Cl. 219-203.000.

Hannan, William James, to RCA Corporation. Token and reader for vending machines. 4,108,367, Cl. 235-457.000.

Hanni, Stephen L.; and Johnson, Dudley B., to Texas Instruments Incorporated. Connector with printed wiring board structure. 4,109,298, Cl. 361-412.000.

Hansel, William B., to Suntech, Inc. Vapor receiving system for a dispensing nozzle. 4,108,223, Cl. 141-392.000.

Hansen, Dale J.: *See*—
Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., 4,108,632, Cl. 71-115.000.

Hanson Industries Inc.: *See*—
Swan, Jack C., Jr., 4,108,928, Cl. 264-26.000.

Hanson Research Corporation: *See*—
Hanson, William A.; and Barr, Graham S. S., 4,108,602, Cl. 23-230.00R.

Hanson, William A.; and Barr, Graham S. S., to Hanson Research Corporation. Sample changing chemical analysis method and apparatus. 4,108,602, Cl. 23-230.00R.

Hara, Yoshimichi: *See*—
Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.

Harada, Hiroyuki: *See*—
Arisaka, Kunio; and Harada, Hiroyuki, 4,109,258, Cl. 354-38.000.

Harada, Shuzi: *See*—
Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, 4,109,143, Cl. 235-462.000.

Haralampu, Stephen G.: *See*—
Rahman, Abdul R.; and Haralampu, Stephen G., 4,109,026, Cl. 426-640.000.

Haring, Samuel L.: *See*—
Denman, Donald E.; and Haring, Samuel L., 4,109,112, Cl. 179-81.00R.

Harmon, Shepard L.: *See*—
Hadl, Clyde F.; and Harmon, Shepard L., 4,108,705, Cl. 156-355.000.

Harper, William Anthony. Solar water heating apparatus. 4,108,160, Cl. 126-271.000.

Harris, Glyn Islwyn: *See*—
Edwards, Alfred Gerald; and Harris, Glyn Islwyn, 4,108,822, Cl. 260-32.80R.

Harrison, Anthony William, to Girling Limited. Railway brake assemblies including knock-back compensating means. 4,108,284, Cl. 188-59.000.

Harrison, Charles H.: *See*—
Andersen, Harold Willids; and Harrison, Charles H., 4,107,976, Cl. 73-52.000.

Harrison, George W.; and Huff, Charles O., to Team, Inc. Method and apparatus for a tapered pipeline seal. 4,108,194, Cl. 137-15.000.

Harrison, Henry: *See*—
Lyon, Floyd A.; and Harrison, Henry, 4,108,374, Cl. 237-1.00A.

Hartman, Robert M.; and Trott, Arthur F., to Concept Inc. Reciprocation vitreous suction cutter head. 4,108,182, Cl. 128-305.000.

Hartmann, Job-Werner: *See*—
Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.

Hartmann, John Fredrik Alf: *See*—
Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.

Hase, Noboru: *See*—
Okabe, Hiroshi; Hase, Noboru; Asai, Hitoshi; and Hiramatu, Teruo, 4,107,969, Cl. 72-148.000.

Hase, Yoshihiko: *See*—
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Hashimoto, Akihiko, to Olympus Optical Company Ltd. Focal plane shutter. 4,109,265, Cl. 354-244.000.

Hashimoto, Mitsuru: *See*—
Ohta, Masafumi; Hashimoto, Mitsuru; and Kozima, Akio, 4,108,656, Cl. 96-1.50R.

Hashimoto, Noritsugu; and Kagano, Shinichi, to Hitachi Maxell, Ltd. Magnetic recording tape cartridge. 4,108,398, Cl. 242-199.000.

Hashimoto, Teiji: *See*—
Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, 4,109,257, Cl. 354-23.00R.

Hashimoto, Toshio: *See*—
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,108,971, Cl. 423-428.000.

Hashimoto, Tsutomu: *See*—
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,108,804, Cl. 521-121.000.

Hatakeyama, Susumu: *See*—
Nagase, Toshiro; and Hatakeyama, Susumu, 4,108,416, Cl. 248-400.000.

Hatanaka, Masayuki; Matsumoto, Makoto; and Yonezawa, Masaharu, to Toshiba Silicone Co., Ltd. Silicone rubber compositions. 4,108,833, Cl. 528-31.000.

Hatch, Burton D., to General Electric Company. Liquid-gas phase separation for self-contained liquid metal current collectors. 4,108,616, Cl. 55-48.000.

Hatch, John Alva, to National Semiconductor Corporation. Opto-coupler semiconductor device. 4,109,269, Cl. 357-19.000.

Hattori, Hiroyuki: *See*—
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,108,427, Cl. 271-9.000.

Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, to Kao Soap Co., Ltd.; and Kawaken Fine Chemicals Co., Ltd. Process for oxidation of monosaccharides. 4,108,891, Cl. 260-528.000.

Haubrich, Lothar: *See*—
Durr, Heinrich; and Haubrich, Lothar, 4,108,297, Cl. 400-354.000.

Hauck, Dorothy M. Caddy for knitting and crocheting yarn. 4,108,397, Cl. 242-137.100.

Hauray, Guy J. L.; and Chapdelaine, William E., to Guyray Industries, Inc. (Entire). Rocker suspension system. 4,108,415, Cl. 248-370.000.

Hauschopp, Alois; and Peters, Wolfgang, to Gewerkschaft Eisenhutte Westfalia. Guides for mineral mining machines. 4,108,495, Cl. 299-43.000.

Hawkins, Barbara Jean. Device for exposing photographically sensitized sheets. 4,108,548, Cl. 355-74.000.

Hawkins, Harold V.: *See*—
Schreyer, Kenneth D.; and Hawkins, Harold V., 4,108,014, Cl. 74-243.00H.

Hawley, Jack S., to Pneumeric Corp. Valve arrangement. 4,108,205, Cl. 137-554.000.

Hayase, Masao; and Araki, Kazunori, to Mitsubishi Jukogyo Kabushiki Kaisha. Bag packing apparatus. 4,108,300, Cl. 198-479.000.

Hayashi, Katsumi; Iijima, Yoo; and Okutsu, Eiichi, to Fuji Photo Film Co., Ltd. Process for developing photographic light-sensitive materials for the graphic arts. 4,108,662, Cl. 96-66.500.

Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, to Teijin Limited. Suede-like raised woven fabric and process for the preparation thereof. 4,109,038, Cl. 428-91.000.

Hayashi, Kiyoshige: *See*—
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Hayashi, Nobuyuki; Isobe, Asao; Tsukada, Katsushige; and Ishimaru, Toshiaki, to Hitachi Chemical Co., Ltd. Monofunctional monomer-containing photosensitive composition for photoresist. 4,108,666, Cl. 96-115.00P.

Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Internal combustion engine having an improved inlet valve arrangement. 4,108,132, Cl. 123-188.00S.

Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, to Nippon Coinco Co., Ltd. Coin receiving apparatus for a vending machine. 4,108,296, Cl. 194-99.000.

Hayes, Hugh V., to United States of America, Army. Paper tape canister. 4,108,390, Cl. 242-55.530.

Hayes, William R., to Dow Corning Corporation. Flame retardant heat-curable silicone compositions containing ceric hydrate. 4,108,825, Cl. 260-37.0SB.

Hays, Allen E.: *See*—
Luthe, Fred J.; and Hays, Allen E., 4,108,210, Cl. 138-42.000.

Hays, George E.: *See*—
Cook, Charles F.; and Hays, George E., 4,108,244, Cl. 166-268.000.

Hazemeijer B.V.: *See*—
Lipperts, Joseph H. F. G., 4,109,122, Cl. 200-144.00B.
Lipperts, Joseph H. F. G., 4,109,123, Cl. 200-144.00B.

Hazen Research Inc.: *See*—
Reynolds, James E., 4,108,635, Cl. 75-24.000.

Heath, Robert Boyson, to Rainsfords Metal Products Proprietary Limited. Pressure-free seat belt retractor. 4,108,395, Cl. 242-107.700.

Heaton, Clifford C.: *See*—
Martone, Ronald J.; Goldman, Samuel C.; and Heaton, Clifford C., 4,109,150, Cl. 250-368.000.

Hedin, Robert A. Programmable electronic sign. 4,109,245, Cl. 340-334.000.

Hedstrom, Per-Goran, to Husqvarna AB. Electronic circuits for sewing machines. 4,108,091, Cl. 112-158.00E.

Heinz, Lothar: *See*—
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,109,155, Cl. 250-505.000.

Heit, Martin A.: *See*—
Vogt, Robert K.; and Heit, Martin A., 4,108,303, Cl. 198-781.000.

Heiter, George Ludwig: *See*—
Donnell, John Robinson; Heiter, George Ludwig; and Miedema, Hotze, 4,109,212, Cl. 328-163.000.

Helder, Johan; De Steur, Hubert; and Pernegger, Wolfgang, to Siemens Aktiengesellschaft. Two-beam colorimeter. 4,108,555, Cl. 356-184.000.

Helgesen, Willy, to Trio Engineering Ltd. Machine for loading fish in boxes. 4,107,904, Cl. 53-142.000.

Helle, Amiel R.: *See*—
Meyer, Stephen F.; Helle, Amiel R.; and Niese, Leo J., 4,109,314, Cl. 364-552.000.

Heller, Carl A., to United States of America, Navy. Analytical method for TNT in water. 4,108,604, Cl. 23-230.00R.

Heller, Ferdinand P., to Amchem Products, Inc. Method for producing an amorphous, light weight calcium phosphate coating on ferrous metal surfaces. 4,108,690, Cl. 148-6.15R.

Heller, Juerg: *See*—
Fleck, Fritz; and Heller, Juerg, 4,108,887, Cl. 260-465.00H.

Hemler, Charles L.; and Stine, Laurence O., to UOP Inc. Method of regenerating coke-contaminated catalyst with simultaneous combustion of carbon monoxide. 4,108,795, Cl. 252-419.000.

Hemming, Donald C.; Hahn, Robert E.; and Robinson, John W., Jr., to Revere Copper and Brass, Incorporated. Recovery of chromium values from waste streams by the use of alkaline magnesium compounds. 4,108,596, Cl. 8-94.270.

Hencke, Dietmar: *See*—
Furstenberg, Joachim; and Hencke, Dietmar, 4,107,910, Cl. 57-34.00R.

Henderson Clay Products, Inc.: *See*—
Gresham, Lucius C., Jr., 4,108,586, Cl. 425-89.000.

Henderson, Cyril, to American Safety Equipment Corporation. Emergency locking retractor with comfort belt tension. 4,108,393, Cl. 242-107.000.

Hendley, Robert N.: *See*—
Paitson, John Lloyd; and Hendley, Robert N., 4,108,272, Cl. 181-120.000.

Hendriks, Petrus F.A.M.: *See*—
van Hardeveld, Rudolf; and Hendriks, Petrus F.A.M., 4,109,090, Cl. 544-201.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Ploger, Walter; and Gutzschebauch, Claus, 4,108,961, Cl. 423-265.000.
Ploger, Walter; and Gutzschebauch, Claus, 4,108,962, Cl. 423-265.000.

Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, to BASF Aktiengesellschaft. Magnetic thin film storage device. 4,109,317, Cl. 365-133.000.

Henneuse, Paul Raymond: *See*—
Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, 4,109,215, Cl. 330-254.000.

Henry, Arthur C., to Shell Oil Company. Benzylhydroxylamine ethers. 4,108,897, Cl. 260-570.80R.

Henry, David W.; and Tong, George L., to SRI International. 5-Iminodaunomycin. 4,109,076, Cl. 536-4.000.

Henzel, Richard Paul: *See*—
Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, 4,108,850, Cl. 260-162.000.

Herbst, Heiner; and Mueller, Ruediger, to Siemens Aktiengesellschaft. Lateral bipolar transistor. 4,109,272, Cl. 357-35.000.

Herbst, Rolf, to Thyssen Industrie Aktiengesellschaft. Weapon mounting arrangement. 4,108,045, Cl. 89-36.00K.
Hercules Incorporated: *See—*
Aldrich, Paul Harwood, 4,109,053, Cl. 428-413.000.
Herman, Eugene T., to Goodyear Tire & Rubber Company, The. Traction element for removable track. 4,108,229, Cl. 152-175.000.
Hermelin, Roger R., to Bureau de Recherches Geologiques et Minieres. Polychromic reproduction procedure using strippable masks. 4,108,549, Cl. 355-77.000.
Hermus, Antonius J. M.: *See—*
de Cooker, Mario G. R. T.; and Hermus, Antonius J. M., 4,109,089, Cl. 544-192.000.
Hern, John F.; and Buccellato, Joseph L., to Massey-Ferguson Inc. Latching device. 4,108,483, Cl. 292-272.000.
Herubel, Jean Frederic, to N. Schlumberger & Cie. Drawing device for sliver. 4,107,821, Cl. 19-127.000.
Heske, William Albert, to Dresser Industries, Inc. Optical position sensor. 4,109,147, Cl. 250-231.00P.
Hesston Corporation: *See—*
White, Allen A., 4,108,062, Cl. 100-11.000.
Hestily, Charles Edward, to Singer Company, The. Depth-of-cut mechanism for routers. 4,108,225, Cl. 144-134.00D.
Hetherington, Joseph F., to Hetherington, Joseph F. Fluorescent light fixture. 4,109,303, Cl. 362-216.000.
Hetke, Adolf; and Evans, Walter J., to Ford Motor Company. Sheathed wire feeding of alloy and inoculant materials. 4,108,637, Cl. 75-53.000.
Heubeck, Erich: *See—*
Fleer, Ernst-Otto; and Heubeck, Erich, 4,107,846, Cl. 32-27.000.
Heuser, Rolf; and Govaert, George Albert, to U.S. Philips Corporation. Multi-stage integrated injection logic circuit with current mirror. 4,109,162, Cl. 307-203.000.
Hewlett-Packard Company: *See—*
Gort, Alfred Frans; and Moore, Charles E., 4,108,539, Cl. 350-201.000.
Millard, Joe K.; and Cornish, Eldon C., 4,109,183, Cl. 315-392.000.
Pan, Michael, 4,109,315, Cl. 364-705.000.
Hexachimie: *See—*
Cognacq, Jean-Calude; Schweisguth, Bernard; and Teulon, Jean-Marie, 4,109,008, Cl. 424-273.00R.
HI-G Incorporated: *See—*
Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,109,222, Cl. 335-301.000.
Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., to Teledyne Industries, Inc. Dental syringe. 4,108,167, Cl. 128-66.000.
Hicks, Jay C.: *See—*
Wrench, Edwin H., Jr.; Hicks, Jay C.; and McCartney, Joseph F., 4,109,117, Cl. 179-175.30F.
Hideg, Laszlo; and Ernest, Robert P., to Ford Motor Company. Internal combustion engine control system. 4,108,136, Cl. 123-209.000.
High, Charles N.: *See—*
Bolton, Theodore S.; and High, Charles N., 4,107,939, Cl. 62-89.000.
Hijikata, Akiko: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
Hill, Robert B. Apparatus and method for identifying individuals through their retinal vasculature patterns. 4,109,237, Cl. 340-146.30E.
Hillermeier, Robert John: *See—*
Mazzanobile, Salvatore; and Hillermeier, Robert John, 4,108,978, Cl. 424-49.000.
Hillman, Garth Decker, to Northern Telecom Limited. Pressure actuated light pen. 4,109,146, Cl. 250-227.000.
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, to Chemie-Anlagenbau Bischofsheim GmbH; Reuter Technologie GmbH; and Metallgesellschaft Aktiengesellschaft. Organo-metallate polymers and processes for the manufacture thereof. 4,108,807, Cl. 521-118.000.
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, to Chemie-Anlagenbau Bischofsheim GmbH; and Reuter Technologie GmbH. Process of producing shaped structures of crosslinked elastomeric polyurethane. 4,108,954, Cl. 264-216.000.
Hilti Aktiengesellschaft: *See—*
Seghezzi, Hans Dieter; Klimesch, Bernhard; and Zsalatz, Reinhold, 4,107,890, Cl. 52-379.000.
Hinman, Wilbur S., Jr.; Sommer, Helmut; and Tozzi, Louis M., to United States of America, Army. Means for suppressing oscillator-generated noise in doppler proximity fuzes. 4,108,075, Cl. 102-214.000.
Hintner, Josef; and Pick, Peter, to Knorr-Bremse GmbH. Brake accelerator for air brake system of a railway vehicle. 4,108,501, Cl. 303-82.000.
Hinze, Heinz-Joachim: *See—*
Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.
Hirabayashi, Nobuhiro: *See—*
Katsurayama, Hiromasa; and Hirabayashi, Nobuhiro, 4,109,286, Cl. 360-96.000.
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Hiramatu, Teruo: *See—*
Okabe, Hiroshi; Hase, Noboru; Asai, Hitoshi; and Hiramatu, Teruo, 4,107,969, Cl. 72-148.000.
Hirano, Masao: *See—*
Kimura, Kazuo; Hirano, Masao; Sugita, Isao; and Fujita, Ryuzo, 4,108,947, Cl. 260-889.000.
Hirmann, Georg, to Repapress AG. Inflatable thrust producing tool. 4,108,486, Cl. 294-99.00R.
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited. Method for optical resolution of DL-lysine compounds. 4,108,723, Cl. 195-2.000.
Hirose, Ryusho; and Wakui, Kotaro, to Canon Kabushiki Kaisha; and Nippon Hoso Kyokai. Television camera optics with a light guide for camera adjustment. 4,109,279, Cl. 358-55.000.
Hirose, Takeshi: *See—*
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Hirose, Yutaka: *See—*
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Hitachi Chemical Co., Ltd.: *See—*
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Hitachi Heating Appliances Co., Ltd.: *See—*
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Hitachi, Ltd.: *See—*
Fujita, Masahiko; Gotoh, Toshihiko; and Hagino, Hiroshi, 4,109,170, Cl. 310-68.00R.
Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, 4,109,160, Cl. 290-52.000.
Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.
Sato, Takao; and Sugiyama, Sakae, 4,108,720, Cl. 176-20.00R.
Shibukawa, Suetaroo, 4,108,131, Cl. 123-148.0CC.
Yamabe, Masahiro, 4,108,570, Cl. 416-186.00R.
Hitachi Maxell, Ltd.: *See—*
Hashimoto, Noritsugu; and Kagano, Shinichi, 4,108,398, Cl. 242-199.000.
Hochmann, Thibaud: *See—*
Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., 4,108,185, Cl. 401-88.000.
Hodgson, Duncan Barry, to Lucas Industries Limited. Drive circuits for a piezoelectric stack. 4,109,174, Cl. 310-316.000.
Hoebrechts, Albert G.: *See—*
vanden Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 4,107,814, Cl. 15-250.420.
Hoechst Aktiengesellschaft: *See—*
Krieg, Martin; and Olffers, Theo, 4,108,769, Cl. 210-50.000.
Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.
Moraw, Roland, 4,108,550, Cl. 355-133.000.
Schroter, Herbert; and Stein, Eckehard, 4,109,268, Cl. 354-299.000.
Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,109,087, Cl. 544-115.000.
Denzel, Theodor; and Hoehn, Hans, 4,109,091, Cl. 544-250.000.
Hoff, Carl Preston; and Martin, Robert Arthur. Apparatus for proportioning and mixing liquids. 4,108,335, Cl. 222-137.000.
Hoffmann-La Roche Inc.: *See—*
Avenia, Richard William; and Pecherer, Benjamin, 4,108,973, Cl. 424-1.000.
Burri, Kaspar F.; Kienzle, Frank; and Rosen, Perry, 4,109,086, Cl. 544-63.000.
Hajos, Zoltan George; and Parrish, David Richard, 4,108,898, Cl. 260-586.00C.
Meienhofer, Johannes Arnold, 4,108,846, Cl. 260-112.50R.
Rosen, Perry, 4,108,888, Cl. 260-465.00F.
Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Label applying machine. 4,108,709, Cl. 156-446.000.
Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Apparatus for applying labels to containers. 4,108,710, Cl. 156-450.000.
Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Label feed. 4,108,711, Cl. 156-497.000.
Hoffmeister, Dirk: *See—*
Gerlach, Albrecht; Holzmann, Dieter; Mlynek, Daniel; and Hoffmeister, Dirk, 4,109,210, Cl. 328-61.000.
Hofmann, Rudiger: *See—*
von Basse, Paul Werner; and Hofmann, Rudiger, 4,109,270, Cl. 357-23.000.
Hofrichter, Gernot: *See—*
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,109,013, Cl. 424-315.000.
Holchuk, Leonard J. Vehicle wheel. 4,108,231, Cl. 152-290.000.
Holden, Kenneth G.: *See—*
Gleason, John G.; Holden, Kenneth G.; and Yim, Nelson C. F., 4,108,854, Cl. 260-252.000.
Holden, Kenneth George, to SmithKline Corporation. 2,3,4,5-Tetrahydro-1H-3-benzazepine-7,8-diones. 4,108,989, Cl. 424-244.000.
Hollandse Signaalapparaten B.V.: *See—*
Van Dort, Jacobus Maurits, 4,107,914, Cl. 57-164.000.
Holley, Larry D.: *See—*
United States of America, National Aeronautics and Space Administration; Holley, Larry D.; and Ward, James O., 4,109,213, Cl. 330-2.000.
Hollingsworth, Ashley J.; and Shamlian, Ralph B., to Farallon Industries, Inc. Pressure gauge. 4,107,996, Cl. 73-300.000.
Hollweck, Walter, to Inter Control Hermann Kohler Elektrik GmbH &

Co. KG. Temperature regulator and safety thermostat. 4,109,225, Cl. 337-42.000.
Holmes, Joseph Arthur Henry: *See—*
Cook, Peter Henry; and Holmes, Joseph Arthur Henry, 4,107,853, Cl. 35-35.00H.
Holroyd, Joseph A.: *See—*
Barger, J. P.; and Holroyd, Joseph A., 4,108,109, Cl. 118-52.000.
Holt, Jan D.: *See—*
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,108,080, Cl. 105-199.0CB.
Holt, Joseph C.: *See—*
Fidler, Fred; and Holt, Joseph C., 4,108,099, Cl. 113-120.00A.
Holzmann, Dieter: *See—*
Gerlach, Albrecht; Holzmann, Dieter; Mlynek, Daniel; and Hoffmeister, Dirk, 4,109,210, Cl. 328-61.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Iwao, Suminari, 4,108,952, Cl. 261-44.00R.
Matsuda, Tamotsu; and Kuroda, Hiroshi, 4,108,376, Cl. 237-12.30A.
Honeywell Inc.: *See—*
Abel, Irving R.; and Reynolds, Bruce R., 4,109,149, Cl. 250-347.000.
Carmody, Joseph P., 4,109,196, Cl. 324-62.000.
Erickson, Clifford W., 4,109,233, Cl. 340-15.000.
Graf, Carl P., 4,109,145, Cl. 250-201.000.
Honeywell Information Systems Inc.: *See—*
Besenfelder, Edward Roald; Cantrell, Steve Garner; and Cobeen, Charles Peter, 4,109,236, Cl. 340-146.10F.
Hopkins, Robert Sherman, Jr.; Banks, Arthur James; and Dischert, Robert Adams, to RCA Corporation. Memory read/write organization for a television signal processor. 4,109,276, Cl. 358-4.000.
Hopper, James H. Bicycle spindle. 4,108,461, Cl. 280-279.000.
Hoppstock, Frederic H.; and Frech, Kenneth J., to Goodyear Tire & Rubber Company, The. Oxidative dehydrogenation of olefins to diolefins. 4,108,918, Cl. 260-680.00E.
Hoppstock, Frederic H.; and Frech, Kenneth J., to Goodyear Tire & Rubber Company, The. Oxidative dehydrogenation of olefins to diolefins. 4,108,919, Cl. 260-680.00E.
Horne, William E., to Boeing Company, The. Method of making an array of solar cells. 4,108,704, Cl. 156-272.000.
Hornsby, James R., Jr. Propulsion toy. 4,107,871, Cl. 46-83.000.
Horst, Russel J.: *See—*
Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., 4,108,734, Cl. 203-7.000.
Houck, Stanley J.: *See—*
Appleby, Paul E.; Houck, Stanley J.; and Nash, Richard B., 4,108,707, Cl. 156-397.000.
Hough, Edmund Alan, to Imperial Chemical Industries Limited. Adhering method. 4,108,351, Cl. 229-62.000.
Hounsell, Melvin Wayne: *See—*
Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.
Howard, Ben Bruce: *See—*
Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.
Howland, Paul George; and Alexander, John Mergle, to Pennwalt Corporation. Rotary tabletting press with powder feed adjustment valve. 4,108,338, Cl. 222-286.000.
Hoya Corporation: *See—*
Toratani, Hisayoshi; and Izumitani, Tetsuro, 4,108,673, Cl. 106-47.00Q.
Hoya Glass Works, Ltd.: *See—*
Asahara, Yoshiyuki; and Izumitani, Tetsuro, 4,108,621, Cl. 65-30.00R.
Hoyer, Georg-Alexander; and Pieroh, Ernst Albrecht, to Schering AG. Salts of thiocarbamic esters with fungicidal and fungistatic action. 4,108,885, Cl. 260-455.00A.
Hrastnik, Walter: *See—*
Watson, Charles J.; and Hrastnik, Walter, 4,108,537, Cl. 350-150.000.
Hruza, Anne: *See—*
Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.
Hudis, Martin: *See—*
Wycklendt, Daniel A.; and Hudis, Martin, 4,109,228, Cl. 337-276.000.
Hudson, Frederick W., to Xerox Corporation. Developer housing. 4,108,111, Cl. 118-655.000.
Hudson, Frederick W., to Xerox Corporation. Developer housing. 4,108,112, Cl. 118-655.000.
Hudson, George David: *See—*
Blitchington, Frank Henning; and Hudson, George David, 4,109,158, Cl. 250-548.000.
Hueschen, Robert E.: *See—*
Love, William D.; and Hueschen, Robert E., 4,109,058, Cl. 428-553.000.
Huff, Charles O.: *See—*
Harrison, George W.; and Huff, Charles O., 4,108,194, Cl. 137-15.000.
Hughes Aircraft Company: *See—*
Bilow, Norman, 4,108,836, Cl. 528-128.000.
Burbank, Ronald Brent; Eisenhart, Bruce S.; Hall, James R.; and Hamilton, James M., 4,109,192, Cl. 320-1.000.
Ozdemir, Faik S.; and Loper, Dall D., 4,109,029, Cl. 427-84.000.
Zanio, Kenneth W.; and Fraas, Lewis M., 4,108,684, Cl. 136-89.0TF.
Hughes, John Lawrence: *See—*
Liu, Robert Chung-Huan; and Hughes, John Lawrence, 4,109,014, Cl. 424-326.000.
Hughes, John Ronald: *See—*
Bates, Paul Edward; Hughes, John Ronald; and Zoueshtiagh, Nahid, 4,109,012, Cl. 426-302.000.
Hughes, Robert M. Coin-operated recording machine. 4,108,365, Cl. 235-419.000.
Hughes Tool Company: *See—*
Bozarth, Rex O., 4,108,260, Cl. 175-374.000.
Humber, Leslie G.: *See—*
Demerson, Christopher A.; and Humber, Leslie G., 4,108,998, Cl. 424-258.000.
Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,108,997, Cl. 424-256.000.
Hunke, Siegfried H., to Textron, Inc. Cluster type rolling mill. 4,107,971, Cl. 72-237.000.
Hunt, Keats E.: *See—*
Gordon, Phillip B., Jr.; and Hunt, Keats E., 4,107,927, Cl. 60-605.000.
Hunter, A. Reese: *See—*
Cotton, Worth, Jr.; and Hunter, A. Reese, 4,107,891, Cl. 52-394.000.
Hurkmans, Antonius: *See—*
Van Elten, Gerrit Jan; and Hurkmans, Antonius, 4,108,056, Cl. 99-452.000.
Huseby, Irvin C.; and Klug, Frederic J., to General Electric Company. Mixed oxide compounds for casting advanced superalloy materials. 4,108,676, Cl. 106-65.000.
Husqvarna AB: *See—*
Hedstrom, Per-Goran, 4,108,091, Cl. 112-158.00E.
Hutchings, William F., to General Signal Corporation. Fluid injection and sampling device for an in-line blender. 4,109,318, Cl. 366-140.000.
Hydreclaim Corporation: *See—*
Moller, Richard W., 4,108,334, Cl. 222-136.000.
ICI Americas Inc.: *See—*
Rutledge, Thomas F., 4,108,908, Cl. 568-730.000.
Idemitsu Petrochemical Co., Ltd.: *See—*
Takemura, Toshisade; Sugi, Shohzaburo; Nagata, Kenji; and Yahagi, Ryohhei, 4,108,912, Cl. 260-667.000.
Ihle, Josef, to Ungerer geb. Dollinger, Irma. Machine for flattening strip metal. 4,107,970, Cl. 72-165.000.
Iijima, Hiroshi, to Nippon Electric Company, Ltd. Memory circuit with protection circuit. 4,109,161, Cl. 307-87.000.
Iijima, Tadashi. Quantitative supply apparatus of powder coloring agent. 4,108,337, Cl. 222-194.000.
Iijima, Yoo: *See—*
Hayashi, Katsumi; Iijima, Yoo; and Okutsu, Eiichi, 4,108,662, Cl. 96-66.500.
Iimura, Koichi, to Trio Kabushiki Kaisha. Record player cabinet. 4,108,510, Cl. 312-8.000.
Iizuka, Haruhiko, to Nissan Motor Company, Ltd. Fuel-injection internal combustion engine. 4,107,921, Cl. 60-288.000.
Iizumi, Shozo: *See—*
Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.
Ikeura, Kenji: *See—*
Minami, Hidehiro; Ikeura, Kenji; and Shioyama, Giichi, 4,107,920, Cl. 60-276.000.
Illinois Tool Works Inc.: *See—*
Jorgensen, Arne Roy, 4,107,800, Cl. 7-158.000.
Imada, Yoshio. Constant-quantity oil distributing valve for use in central lubrication system. 4,108,278, Cl. 184-7.00D.
IMC Chemical Group, Inc.: *See—*
Otrhalek, Joseph V.; and Gomes, Gilbert Stephen, 4,108,669, Cl. 106-13.000.
Imperial Chemical Industries Limited: *See—*
Allen, John Graham, 4,109,068, Cl. 526-9.000.
Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.
Bowden, Roy Dennis; and Seaton, Thomas, 4,108,856, Cl. 260-290.0HL.
Caunt, Anthony David; Fortuin, Michael Stanley; and Williams, Ian Gabriel, 4,108,796, Cl. 252-429.00B.
Clough, George Francis Gilbert, 4,108,763, Cl. 210-14.000.
Hough, Edmund Alan, 4,108,351, Cl. 229-62.000.
Marsham, Peter Robert, 4,109,015, Cl. 424-341.000.
Moilliet, John Stewart, 4,109,016, Cl. 424-342.000.
Imsande, Grant A., to Arbrook, Inc. Tacky floor mat with improved peeling provision. 4,107,811, Cl. 15-215.000.
Inao, Satoshi. Clothes pole. 4,108,315, Cl. 211-124.000.
Indiana University Foundation: *See—*
Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,979, Cl. 424-49.000.
Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,981, Cl. 424-55.000.
Industrial Air, Inc.: *See—*
Cotton, Worth, Jr.; and Hunter, A. Reese, 4,107,891, Cl. 52-394.000.
Ingenjorsfirman N A Sandbergs Industrikonstruktioner AB: *See—*
Sandberg, Nils Arne, 4,108,499, Cl. 302-34.000.

Innovative Computer Products: *See—*
Varni, Anselm Francis; and Sandor, Joseph, 4,107,810, Cl. 15-97.00R.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi; and Molaug, Ole, 4,108,357, Cl. 235-119.000.

Inoue, Kiyoshi; and Molaug, Ole, to Inoue-Japax Research Incorporated; and Trallfa Nils Underhaug A/S. Feed-rate indicator for electrochemical grinding. 4,108,357, Cl. 235-119.000.

Inoue, Nobuyoshi, to Copal Company Limited. Braking mechanism for focal plane shutters. 4,109,266, Cl. 354-246.000.

Institut National de la Recherche Agronomique: *See—*
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.

Institut National de Recherche Chimique Appliquee Ircha: *See—*
Dick, Richard; Feuillade, Georges; Gedessaud, Robert; and Nicolas, Louis, 4,109,066, Cl. 429-145.000.

Institutt for Atomenergi: *See—*
Olshausen, Kai D., 4,108,719, Cl. 176-19.00R.

Inter Control Hermann Kohler Elektrik GmbH & Co. KG: *See—*
Hollweck, Walter, 4,109,225, Cl. 337-42.000.

International Business Machines Corporation: *See—*
Anderson, Clifford Wilhelm; Mack, Kenneth John; and Martin, Jerry Thomas, 4,108,939, Cl. 264-129.000.
Beismann, Walter; Lampe, Hans Hermann; and Pohle, Werner, 4,108,360, Cl. 235-304.000.
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.
Briska, Marian; and Eisenbraun, Ewald, 4,109,030, Cl. 427-93.000.
Sarkary, Homi G., 4,109,275, Cl. 357-68.000.
Tompkins, James Darrell, 4,109,284, Cl. 358-212.000.

International Flavors & Fragrances Inc.: *See—*
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,799, Cl. 252-522.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,899, Cl. 260-586.00C.
Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.

International Minerals & Chemical Corp.: *See—*
Eckhoff, Paul S., 4,108,811, Cl. 260-22.0TN.

International Nickel Company, Inc., The: *See—*
Shaw, Stuart Walter Ker, 4,108,647, Cl. 75-171.000.
Wearmouth, William Ronald, 4,108,740, Cl. 204-11.000.

International Paper Company: *See—*
Bartley, Thomas S.; and Rosenblath, Quinlan T., Jr., 4,108,574, Cl. 417-19.000.

International Standard Electric Corporation: *See—*
Gingell, Michael John, 4,109,110, Cl. 179-15.0AP.
Ubel, Helmut, 4,108,404, Cl. 246-34.0CT.

International Telephone and Telegraph Corporation: *See—*
Barton, Paul, 4,109,249, Cl. 343-108.00M.
Rucker, Dugan Allan; Wollermann, Louis Albert; and Krum, Jack Kern, 4,109,023, Cl. 426-549.000.

Internationella Siporex AB: *See—*
Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, 4,108,933, Cl. 264-42.000.

Inuzuka, Tsuneki: *See—*
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,108,427, Cl. 271-9.000.

Investigacion Fic Fideicomiso: *See—*
Cardenas-Franco, Luis, 4,108,623, Cl. 65-163.000.

Iowa State University Research Foundation, Inc.: *See—*
Boast, Warren Benefield, 4,109,107, Cl. 179-1.00D.

Irik, Gijsbert Waldemar: *See—*
Boersma, Rintje; and Irik, Gijsbert Waldemar, 4,109,124, Cl. 200-148.00B.

Irro, Fritz: *See—*
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.

Ishii, Hiroki: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.

Ishii, Mutsuo: *See—*
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.

Ishikawa, Haruo: *See—*
Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, 4,109,160, Cl. 290-52.000.

Ishikawa, Hidehiko: *See—*
Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eiichi; and Ishikawa, Hidehiko, 4,108,668, Cl. 96-135.000.

Ishikawa, Kiyotsugu; and Itoh, Kunio, to Matsushita Electronics Corporation. Method for machining surfaces of semiconductor substrates. 4,108,715, Cl. 156-628.000.

Ishimaru, Toshiaki: *See—*
Hayashi, Nobuyuki; Isobe, Asao; Tsukada, Katsushige; and Ishimaru, Toshiaki, 4,108,666, Cl. 96-115.00P.

Ishiyama, Takashi: *See—*
Saito, Takashi, 4,107,947, Cl. 63-2.000.

Isobe, Asao: *See—*
Hayashi, Nobuyuki; Isobe, Asao; Tsukada, Katsushige; and Ishimaru, Toshiaki, 4,108,666, Cl. 96-115.00P.

Isono, Akira: *See—*
Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, 4,109,160, Cl. 290-52.000.

Isuzu Motors Limited: *See—*
Ohta, Tadao, 4,108,116, Cl. 123-32.00A.

Ito, Ryozo; and Tokuda, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Carburetor. 4,108,123, Cl. 123-119.0EC.

Ito, Yuji: *See—*
Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.

Itoh, Kunio: *See—*
Ishikawa, Kiyotsugu; and Itoh, Kunio, 4,108,715, Cl. 156-628.000.

ITT Industries, Incorporated: *See—*
Bolis, Edoardo, 4,108,523, Cl. 339-22.00B.
Gerlach, Albrecht; Holzmann, Dieter; Mlynek, Daniel; and Hoffmeister, Dirk, 4,109,210, Cl. 328-61.000.

Iversen, John E.: *See—*
Welch, Richard D.; and Iversen, John E., 4,108,702, Cl. 156-192.000.

Iwans, Robert C.: *See—*
Lamb, Richard C.; and Iwans, Robert C., 4,107,798, Cl. 4-321.000.

Iwao, Suminari, to Honda Giken Kogyo Kabushiki Kaisha. Variable venturi type engine carburetor. 4,108,952, Cl. 261-44.00R.

Iwatsuki, Masahiro: *See—*
Oishi, Susumu; and Iwatsuki, Masahiro, 4,108,394, Cl. 242-107.40A.

Izumi, Shinjiro. Forming and filling bags of synthetic plastics materials. 4,107,900, Cl. 53-180.00R.

Izumitani, Tetsuro: *See—*
Asahara, Yoshiyuki; and Izumitani, Tetsuro, 4,108,621, Cl. 65-30.00R.
Toratani, Hisayoshi; and Izumitani, Tetsuro, 4,108,673, Cl. 106-47.00Q.

J.A. Wilson Display Limited: *See—*
Shepherd, Charles Grey; and Yeoman, Brian Donald, 4,108,085, Cl. 108-108.000.

J. Bobst & Fils, S.A.: *See—*
Wiedemann, Friedrich, 4,108,302, Cl. 198-689.000.

J. M. Huber Corporation: *See—*
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,108,932, Cl. 264-37.000.

Jackson, Stanley Bishop: *See—*
Miller, Robert Eric; and Jackson, Stanley Bishop, 4,108,412, Cl. 248-181.000.

Jacobs, Stanley C.; King, Larry K.; and Racunas, Bernard J., to Aluminum Company of America. Control of purity and particle size in production of aluminum chloride. 4,108,968, Cl. 423-495.000.

Jacobsen Manufacturing Company: *See—*
Woelffer, Neill Carl, 4,108,120, Cl. 123-103.00B.
Woelffer, Neill Carl; and Grandrud, Merlin Howard, 4,108,456, Cl. 280-47.37R.

Jacobus, Lewis Alfred, Jr., to RCA Corporation. Method of making an insulated gate field effect transistor by implanted double counterdoping. 4,108,686, Cl. 148-1.500.

Jacques, James O.; and Carlson, Robert Dale, to Xerox Corporation. Phase-sensitive transducer apparatus with improved signal offset means. 4,109,189, Cl. 318-608.000.

Jacuzzi Bros. Inc.: *See—*
Wilkes, Robert D.; Peters, Alan H.; and Jacuzzi, Virgil J., 4,108,775, Cl. 210-169.000.

Jacuzzi, Virgil J.: *See—*
Wilkes, Robert D.; Peters, Alan H.; and Jacuzzi, Virgil J., 4,108,775, Cl. 210-169.000.

Jager, Wilfried: *See—*
Grocke, Diethelm W. K.; and Jager, Wilfried, 4,107,905, Cl. 53-3.000.

James, Stanley L.: *See—*
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,107,858, Cl. 36-134.000.

James, Varnell L., to Boeing Company, The. Cargo pallet incorporating retractable ball units. 4,108,455, Cl. 280-43.230.

Jamieson, Robert Stuart. Rigging base for plural-hull sailing craft and methods for sail control. 4,108,100, Cl. 114-102.000.

Janiak, P. Stefan: *See—*
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,109,013, Cl. 424-315.000.

Janome Sewing Machine Co. Ltd.: *See—*
Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.

Janssen, Jacobus Wilhelmus. Potato processing. 4,108,565, Cl. 408-37.000.

Japan Exlan Company Limited: *See—*
Odawara, Kenji; and Takeuchi, Shoichi, 4,108,818, Cl. 260-29.6AQ.

Japan Racing Association, The: *See—*
Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, 4,108,364, Cl. 235-419.000.

Japan Servo Co., Ltd.: *See—*
Fujita, Masahiko; Gotoh, Toshihiko; and Hagino, Hiroshi, 4,109,170, Cl. 310-68.00R.

Japan Synthetic Rubber Co., Ltd.: *See—*
Kimura, Kazuo; Hirano, Masao; Sugita, Isao; and Fujita, Ryuzo, 4,108,947, Cl. 260-889.000.

Japanese National Railways: *See*—
Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, 4,108,288, Cl. 191-49.000.
Jaulmes, Eric, to Ateliers de la Motobecane. Transparent plates with a radiograph thereon and process for the preparation thereof. 4,109,148, Cl. 250-321.000.
Jay, Pierre; and Schwachhofer, Ghislain, to Rhone-Poulenc Industries. Dielectric compositions containing benzyl esters. 4,108,789, Cl. 252-64.000.
Jayme, Manfred: *See*—
Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.
Jean Walterscheid GmbH: *See*—
Geisthoff, Hubert, 4,107,952, Cl. 64-32.00F.
von Allworden, Wilhelm; and Kunze, Dieter, 4,108,464, Cl. 280-508.000.
Jeep Corporation: *See*—
MacAfee, James Edwin; Winkler, John W.; and Budde, Karl, 4,108,021, Cl. 74-606.00R.
Jenaer Glaswerk Schott & Gen.: *See*—
Gliemeroth, Georg, 4,108,674, Cl. 106-53.000.
Jennings, Eugene W., to Stearns-Roger Corporation. Redundant lift beam assembly. 4,108,485, Cl. 294-67.0BC.
JeNor: *See*—
Norris, Orlin R., 4,108,000, Cl. 73-328.000.
Jessup, Wilbur F., to Cincinnati Milacron Inc. Centerless grinding machine. 4,107,881, Cl. 51-103.00R.
Jet Aeration Company: *See*—
Snyder, John R., 4,108,274, Cl. 181-229.000.
Joekel, Alfred; Langen, Hans; and Denner, Peter, to Balke-Durr Aktiengesellschaft. Method for winding spiral fins onto oval tubing. 4,107,832, Cl. 29-157.3AH.
Joh, Yasushi: *See*—
Kaneko, Noriaki; and Joh, Yasushi, 4,108,764, Cl. 210-22.00A.
Johansson, Ake, to Linden-Alimak AB. Drilling apparatus. 4,108,254, Cl. 173-43.000.
John, Erich; Oesterle, Albert; and Pollak-Banda, Erich, to Zahnraderfabrik Renk Aktiengesellschaft. Gear drive with single-helix gears. 4,108,018, Cl. 74-467.000.
Johns-Manville Corporation: *See*—
Lake, Malcolm John; and Snelgrove, William Richard Noble, 4,108,639, Cl. 75-101.00R.
Johns, Paul W.: *See*—
Estes, Lewis W.; and Johns, Paul W., 4,109,042, Cl. 428-193.000.
Johnson, Bruce K., to Polaroid Corporation. Compact prism camera. 4,109,263, Cl. 354-150.000.
Johnson, Dudley B.: *See*—
Hanni, Stephen L.; and Johnson, Dudley B., 4,109,298, Cl. 361-412.000.
Johnson & Johnson: *See*—
Gander, Robert J.; and Gurney, John A., 4,108,880, Cl. 260-410.500.
Rosenblatt, Solomon, 4,108,938, Cl. 264-127.000.
Johnson, Kenneth M., to Packaging Laminators, Inc. Label structure. 4,107,861, Cl. 40-2.00R.
Johnson, Matthey & Co., Limited: *See*—
Walter, Derek Oscar, 4,108,006, Cl. 73-517.00R.
Wilkinson, Geoffrey, 4,108,905, Cl. 260-604.0HF.
Johnson, Raymond M. Display case. 4,108,515, Cl. 312-119.000.
Johnson, Richard C.; and deBenneville, Peter L., to Warren-Teed Laboratories, Inc. 1,4-Dithiinoxides. 4,109,006, Cl. 424-277.000.
Johnson, Robert N.; and Farnham, Alford G. Polyarylene polyethers. 4,108,837, Cl. 528-126.000.
Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., to Rohm and Haas Company. 1-Alkylpyrid-2-ones. 4,108,630, Cl. 71-94.000.
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Andersson, Bo Eric Christer; Carlsson, Lars Ivar; and Johnsson, Rolf Christer Roland, 4,109,060, Cl. 425-566.000.
Johnstone, Richard; and Ostby, Lyle D., to Kearney & Trecker Corporation. Method and apparatus for remote display of analog signals occurring in computer controlled machine tools. 4,109,309, Cl. 364-120.000.
Jones, Bill R.: *See*—
Rode, Walter F.; and Jones, Bill R., 4,108,318, Cl. 214-1.00R.
Jones, Christopher Robin: *See*—
Williams, Malcolm; and Jones, Christopher Robin, 4,108,115, Cl. 123-32.0EB.
Jones, Everett E. Mechanized contour-following drill machine. 4,108,566, Cl. 408-115.00R.
Jones, Loyd W., to Standard Oil Company (Indiana). Converter type scale remover. 4,108,246, Cl. 166-312.000.
Jones, Richard Fred: *See*—
Ligman, James Raymond; and Jones, Richard Fred, 4,107,995, Cl. 73-300.000.
Jones, Roy L., to McDonnell Douglas Corporation. Five component strain gauge balance. 4,107,986, Cl. 73-147.000.
Jorgensen, Arne Roy, to Illinois Tool Works Inc. Combination drilling and wrenching tool. 4,107,800, Cl. 7-158.000.
Jossin, Alain: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,108,999, Cl. 424-258.000.
Jourdan, Paul: *See*—
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,108,373, Cl. 237-1.00A.
Jowett, Terence W.; and Smith, Harvey A., to United Technologies Corporation. Quick connect multiple fluid/electrical transducer apparatus. 4,108,008, Cl. 73-756.000.
Joyce, William Inglis, to Babcock & Wilcox, Limited. Y-jet tip tester. 4,108,554, Cl. 356-156.000.
Jozwiak, Edward L., Jr.; and Das, Suryya K., to PPG Industries, Inc. Method for electrodeposition. 4,108,750, Cl. 204-181.00R.
Jung, Rolf, to Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik. Manually guided cutting machine for sheet material. 4,107,839, Cl. 30-123.300.
Kabilka, Otto; and Schulz, Thilo, to Messerschmitt-Boelkow-Blohm GmbH. Flat high pressure container. 4,108,329, Cl. 220-453.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Kondo, Kenichi, 4,107,916, Cl. 58-38.00R.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Fuchigami, Masao, 4,108,009, Cl. 74-61.000.
Nakao, Kiyoharu, 4,108,269, Cl. 180-98.000.
Tanaka, Yujiro, 4,108,264, Cl. 180-2.00R.
Kabushiki Kaisha Kyowa: *See*—
Yoshimura, Masakiyo; and Yamaguti, Yasukazu, 4,108,823, Cl. 260-33.4PQ.
Kacirek, Kenneth J.; and Rust, Jack E., to PPG Industries, Inc. Glass accumulator. 4,108,319, Cl. 214-6.0BA.
Kagami, Soichi: *See*—
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
Kagano, Shinichi: *See*—
Hashimoto, Noritsugu; and Kagano, Shinichi, 4,108,398, Cl. 242-199.000.
Kahler, Richard W. Storage compartment cap for liquid-filtered smoking device. 4,108,152, Cl. 131-173.000.
Kain, Marino: *See*—
Frano, Paul A.; Bowman, Robert W.; Drapeau, Donald F.; and Kain, Marino, 4,109,222, Cl. 335-301.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Broverman, Irwin, 4,108,688, Cl. 148-3.000.
Kaji, Isamu; and Maeda, Naoyuki. Transistor amplifier applying large output currents to a load. 4,109,167, Cl. 307-270.000.
Kakinuma, Toshihide: *See*—
Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.
Kali-Chemie Aktiengesellschaft: *See*—
Massonne, Joachim; and Becher, Wilfried, 4,108,967, Cl. 423-469.000.
Kalvenes, Oystein: *See*—
Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, 4,108,933, Cl. 264-42.000.
Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, to Mitsubishi Rayon Co., Ltd. Graft-polymer composition of rubber for reinforcing crosslinked resin. 4,108,946, Cl. 260-881.000.
Kamatics Corporation: *See*—
Orkin, Stanley S., 4,108,505, Cl. 308-72.000.
Kamio, Kunimasa: *See*—
Akagane, Katsuo; Adachi, Teruho; and Kamio, Kunimasa, 4,108,924, Cl. 260-837.0PV.
Kan, Jury Evgenievich: *See*—
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.
Kanagawa, Tadashi; and Nakasa, Hiroyasu, to Central Research Institute of Electric Power Industry. Method of estimating ground pressure. 4,107,981, Cl. 73-88.00E.
Kanazashi, Tetsuo; and Fujiwara, Tsuyoshi, to Pioneer Electronic Corporation. Terminal device for CATV. 4,109,281, Cl. 358-114.000.
Kanda, Takeshi: *See*—
Takeda, Hiroo; Kanda, Takeshi; Oguchi, Yutaka; and Asano, Naomasa, 4,108,682, Cl. 134-25.00R.
Kane, James: *See*—
Gale, Michael Thomas; and Kane, James, 4,108,660, Cl. 96-38.200.
Kaneko, Noriaki; and Joh, Yasushi, to Nippon Ceon Co., Ltd. Method and apparatus for removing gas from interior of hollow-fiber permeability apparatus. 4,108,764, Cl. 210-22.00A.
Kantor, Gideon, to United States of America, Health, Education and Welfare. Direct contact microwave diathermy applicator. 4,108,147, Cl. 128-404.000.
Kao Soap Co., Ltd.: *See*—
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.
Kaplan, Gerald Stanley, to RCA Corporation. Clutter free communications radar. 4,109,247, Cl. 343-6.50R.
Karlskronavarvet AB: *See*—
Lindstrom, Karl Olof, 4,108,102, Cl. 114-264.000.
Karlstedt, Gustav Sven Erik: *See*—
Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.
Karpati, Egon: *See*—
Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.

Kashioka, Seiji: *See*—
Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.
Kashiwara, Hirofumi: *See*—
Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,109,181, Cl. 315-169.0TV.
Katakura, Masayuki; and Yamada, Hisashi, to Tokyo Shibaura Electric Co., Ltd. RMS circuit. 4,109,165, Cl. 307-229.000.
Katayama, Hideaki: *See*—
Kubo, Masayoshi; and Katayama, Hideaki, 4,108,776, Cl. 210-224.000.
Kato, Tetuo, to Tokico Ltd. Double-cylinder buffer. 4,108,287, Cl. 188-315.000.
Kato, Yoshio: *See*—
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,108,804, Cl. 521-121.000.
Katsurayama, Hiromasa; and Hirabayashi, Nobuhiro, to Shin-Shirasuna Electric Corp. Cassette tape recorder with cassette eject mechanism. 4,109,286, Cl. 360-96.000.
Kaufman, George, to Union Carbide Corporation. Collapsible disposable funnel. 4,108,222, Cl. 141-337.000.
Kawada, Yoshinosuke: *See*—
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,108,155, Cl. 126-270.000.
Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, to Bristol-Myers Company. Antibiotic complex. 4,108,725, Cl. 195-96.000.
Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, to Yamasa Shoyu Kabushiki Kaisha. Stabilized S-adenosyl-L-methionine preparations. 4,109,079, Cl. 536-26.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,108,039, Cl. 84-1.190.
Kawai, Satoshi; Sato, Hajime; and Sakai, Toshimatsu, to Pilot Man-Nun-Hitsu Kabushiki Kaisha. Process for recording information or sound and process for preparation of recording materials used therefor. 4,109,287, Cl. 360-131.000.
Kawai, Wasaburo, to Agency of Industrial Science & Technology. Photosensitive polyesters. 4,108,844, Cl. 526-217.000.
Kawaken Fine Chemicals Co., Ltd.: *See*—
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, 4,109,157, Cl. 250-531.000.
Kawashima, Yuji: *See*—
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Kawecki Berylco Industries, Inc.: *See*—
Gennone, Richard J.; and Sturdevant, Robert D., 4,108,646, Cl. 75-148.000.
Kazaroff, John M.: *See*—
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Kearney & Trecker Corporation: *See*—
Johnstone, Richard; and Ostby, Lyle D., 4,109,309, Cl. 364-120.000.
Keen, Ralph H.; Kimsey, Raymond D.; and Seaman, Gary G., to Western Electric Company, Incorporated. Arranging randomly positioned articles into preselected positions. 4,107,838, Cl. 29-628.000.
Keeney, Lawrence V., to Energy Conservation Devices, Inc. Control device and process for heating an installation. 4,108,375, Cl. 237-8.00R.
Keeton, John H. Thread cutter. 4,108,098, Cl. 112-289.000.
Keith, Wayland D. Depth indicating and depth controlling devices for earth moving machines. 4,107,859, Cl. 37-126.00A.
Keller, Wolfgang; and Reuschel, Konrad, to Siemens Aktiengesellschaft. Process for producing plate-shaped silicon bodies for solar cells. 4,108,714, Cl. 156-608.000.
Kelley, James E.; and Stemler, Orrin A., to Caterpillar Tractor Co. Apparatus for forcibly engaging machine assemblies. 4,108,561, Cl. 403-166.000.
Kelly, John C.; and Pardo, Brian D., to American Solar King Corporation. Thermal energy method and machine. 4,107,928, Cl. 60-650.000.
Kemiska Konsultbyran A.G.: *See*—
Weiss, Josef, 4,108,771, Cl. 210-50.000.
Keneman, Scott Allen: *See*—
Catanese, Carmen Anthony; Endriz, John Guiry; and Keneman, Scott Allen, 4,109,178, Cl. 315-12.00R.
Kenkare, Divaker B.; and Shumway, Durland K., to Colgate-Palmolive Company. Method of producing improved antiperspirant composition. 4,108,977, Cl. 424-46.000.
Kennecott Copper Corporation: *See*—
Owen, Edwin Lewis; and Marshall, David William, 4,109,028, Cl. 427-58.000.
Kennedy, Benton B. Catfish trap. 4,107,867, Cl. 43-65.000.
Kennedy, William S.: *See*—
Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., 4,108,432, Cl. 273-29.00A.
Kermoian, Gary H., to Dolco Packaging Corporation. Shear molding of reinforced latch. 4,108,941, Cl. 264-154.000.
Kessler Products Co., Inc.: *See*—
Ullman, Myron E., Jr., 4,107,897, Cl. 52-823.000.
Kett Electric Laboratory: *See*—
Murakami, Osamu, 4,108,004, Cl. 73-432.00R.
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Lowery, Louie Russell, 4,108,321, Cl. 214-8.50A.
Keyes, Lorne Allan: *See*—
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Kharazov, Konkordy Innokentievich; Netsvetaev, Gennady Viktorovich; and Trofimov, Valery Ivanovich. Electromagnetic switching device. 4,109,219, Cl. 335-78.000.
Khimushin, Fedor Fedorovich: *See*—
Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.
Khoury, Nick S., to Continental Group, Inc., The. Non-obstructing end closure. 4,108,331, Cl. 220-269.000.
Khvalovsky, Vladimir Vasilievich; Natarovsky, Sergei Nikolaevich; Nalivaiko, Valentin Iosifovich; and Vorontsov, Vladimir Lvovich. Device for coherent lighting of objects. 4,109,304, Cl. 362-259.000.
Kiefer, Gerhard: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.
Kiela, Gene F.: *See*—
Radzins, Edmund A.; and Kiela, Gene F., 4,108,584, Cl. 425-83.100.
Kienzle, Frank: *See*—
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Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
Kimball International, Inc.: *See*—
Robinson, John William; and Wilcox, Brian Norris, 4,108,037, Cl. 84-1.030.
Kimsey, Raymond D.: *See*—
Keen, Ralph H.; Kimsey, Raymond D.; and Seaman, Gary G., 4,107,838, Cl. 29-628.000.
Kimura, Kazuo; Hirano, Masao; Sugita, Isao; and Fujita, Ryuzo, to Japan Synthetic Rubber Co., Ltd. Thermoplastic elastomer composition. 4,108,947, Cl. 260-889.000.
Kincaid, Thomas G.; and Stutt, Charles A., to General Electric Company. Apparatus and method for wideband communication with suppression of harmonic interference. 4,109,204, Cl. 325-38.00R.
King, David W.; and Rankin, Emmitt Edward, to Gearhart-Owen Industries, Inc.; and Petro-Data C.A. Apparatus for testing earth formations. 4,108,243, Cl. 166-66.000.
King, Larry K.: *See*—
Jacobs, Stanley C.; King, Larry K.; and Racunas, Bernard J., 4,108,968, Cl. 423-495.000.
King, William J. Ion beam implantation-sputtering. 4,108,751, Cl. 204-192.00N.
Kinugasa, Masayuki: *See*—
Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.
Kiplinger, Terry L.: *See*—
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Kiraly, Ildiko: *See*—
Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.
Kiraly, Louis J., to United States of America, Navy. Liquid-gas constant force recoil spring. 4,108,046, Cl. 89-43.00A.
Kirby, Billy E. Back support. 4,108,492, Cl. 297-284.000.
Kishi, Yoshito; Nakatsuka, Shinichi; and Tanino, Hideo, to Fujisawa Pharmaceutical Co., Ltd. Azetothiazole-5-yl-3-halomethyl-2-butenoic acid derivatives and the preparation of 5-thia-1-azabicyclo-[4.2.0]-2-octene-2-carboxylic acid derivatives from them. 4,108,861, Cl. 260-306.70C.
Kissane, Richard J.: *See*—
Pearson, Bert David; and Kissane, Richard J., 4,108,607, Cl. 23-253.00R.
Kissick, Thomas P.: *See*—
Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., 4,108,860, Cl. 260-304.00A.
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Kitahira, Takashi: *See*—
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Kitamoto, Tatsuji: *See*—
Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, 4,108,787, Cl. 252-62.560.
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Kiyohara, Takehiko: *See*—
Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, 4,109,257, Cl. 354-23.00R.
Kleber, Carl J.: *See*—
Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,979, Cl. 424-49.000.

Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,981, Cl. 424-55.000.
Klein, Kurt: *See*—
Neubeck, Kurt; Schwing, Karl-Heinz; and Klein, Kurt, 4,108,007, Cl. 73-732.000.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the production of acyl cyanides (B). 4,108,875, Cl. 260-347.800.
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Kley, Victor. Keyswitch pad. 4,109,118, Cl. 200-5.00E.
Klimesch, Bernhard: *See*—
Seghezzi, Hans Dieter; Klimesch, Bernhard; and Zsalatz, Reinhold, 4,107,890, Cl. 52-379.000.
Kline, Donald E.: *See*—
Blankenhorn, Paul R.; Cady, Philip D.; Kline, Donald E.; and Weyers, Richard E., 4,109,033, Cl. 427-314.000.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Sulfur-containing phenolic antioxidants. 4,108,830, Cl. 260-45.85S.
Kling, David A.; and Bell, Charles W., to Mulberry Metal Products, Inc. Weatherproof electrical outlet box cover. 4,109,095, Cl. 174-67.000.
Klinge Pharma GmbH & Co.: *See*—
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,109,013, Cl. 424-315.000.
Klinkicht, Helmut. Sieve stringer belt for conveyors. 4,108,298, Cl. 198-834.000.
Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, to Vorwerk & Co Interholding GmbH. Safety interlock device in an electrically driven household mixing apparatus. 4,108,054, Cl. 99-348.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Zenker, Walter, 4,108,291, Cl. 192-4.00R.
Klomser, Jean M.; and Klomser, Jeffrey L. Fireplace closure. 4,108,145, Cl. 126-140.000.
Klomser, Jeffrey L.: *See*—
Klomser, Jean M.; and Klomser, Jeffrey L., 4,108,145, Cl. 126-140.000.
Klopfenstein, Wayne A.: *See*—
Baer, Terry G.; and Klopfenstein, Wayne A., 4,108,233, Cl. 157-1.370.
Kluender, Harold Clinton: *See*—
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,108,892, Cl. 260-514.00D.
Klug, Frederic J.; and Pasco, Wayne D., to General Electric Company. Alumina core for casting DS materials. 4,108,672, Cl. 106-38.900.
Klug, Frederic J.: *See*—
Huseby, Irvin C.; and Klug, Frederic J., 4,108,676, Cl. 106-65.000.
Klug, Joseph R.: *See*—
Yindra, Leonard J.; Evans, David F.; and Klug, Joseph R., 4,108,086, Cl. 108-157.000.
Klundt, Kurt: *See*—
Gross, Helmut; and Klundt, Kurt, 4,108,097, Cl. 112-287.000.
Knape, Fritz. Method for removing ballast from railroad tracks. 4,108,076, Cl. 104-2.000.
Knapp, Heinrich, to Robert Bosch GmbH. Fuel supply system for internal combustion engines. 4,108,128, Cl. 123-139.0AW.
Knight, J. Nelson; and Turner, Roger C., to General Electric Company. Structural support for a refrigerator. 4,107,833, Cl. 29-460.000.
Knoll AG.: *See*—
Bub, Oskar, 4,108,852, Cl. 260-239.30B.
Knoll, William C., to GTE Sylvania Incorporated. High power factor conversion circuitry. 4,109,307, Cl. 363-101.000.
Knorr-Bremse GmbH: *See*—
Gagarin, Gregory G., 4,108,286, Cl. 188-218.0XL.
Hintner, Josef; and Pick, Peter, 4,108,501, Cl. 303-82.000.
Knowles, Philip Neville George; and Pell, Christopher, to Plessey Handel und Investments AG. Radar systems. 4,109,248, Cl. 343-6.50R.
Kobayashi, Nobuyuki: *See*—
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.
Kobayashi, Tatsuo: *See*—
Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, 4,108,133, Cl. 123-191.00S.
Kobelt, Jacob. Caliper brake actuating cylinder. 4,108,285, Cl. 188-72.600.
Koch, Heinz: *See*—
Peter, Wolfgang; Koch, Heinz; and Stubenvoll, Alfred, 4,108,689, Cl. 148-6.15R.
Koch, Ullrich: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.
Koch, Volker: *See*—
Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.
Kochanneck, Uwe. Circular multistory building with a conveyor and elevator movable around the periphery. 4,108,322, Cl. 214-16.10A.
Koehler-Dayton, Inc.: *See*—
Lamb, Richard C.; and Iwans, Robert C., 4,107,798, Cl. 4-321.000.
Koeleman, Gerardus A. J.; and op de Laak, Johannes H. A., to Oce-van der Grinten N.V. Process for developing electrostatic latent images. 4,108,658, Cl. 96-15.00D.
Koenig, Roland: *See*—
Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.
Koerfer, Kurt: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.
Kogler, Peter, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Cutting machine. 4,108,494, Cl. 299-1.000.
Kohara, Tadao, to Maruzen Sewing Machine Co., Ltd. Rotary loop taker for sewing machine. 4,108,095, Cl. 112-184.000.
Kohl, Franz, to Wacker-Chemitronik Gesellschaft fur Elektronik-Grundstoffe mbH. Method for the production of semiconductor rods of large diameter and device for making the same. 4,109,128, Cl. 219-10.430.
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, to Tokyo Shibaura Electric Co., Ltd.; and Toshiba House Living Industry Co., Ltd. Hot air type solar heat-collecting apparatus. 4,108,155, Cl. 126-270.000.
Koizumi, Mitsue: *See*—
Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.
Kojima, Tadao: *See*—
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
Kok, Riekert; and van der Zeeuw, Abraham J., to Shell Oil Company. Extraction of Cu(II), Fe(III), Ni(II), Co(II), Cd(II), Zn(II), Ca(II) and Mg(II) metal values using 2-hydroxy iminoacetic acids. 4,108,958, Cl. 423-24.000.
Kolkowski, James J., to Sprague Electric Company. Capacitors with minimum ESR and method of making the same. 4,107,834, Cl. 29-570.000.
Kolmogorov, Alexandr Burisovich: *See*—
Zagoruiko, Nikolai Grigorievich; and Kolmogorov, Alexandr Borisovich, 4,109,103, Cl. 179-1.0SG.
Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Copper phthalocyanine of novel crystal form. 4,108,863, Cl. 260-314.500.
Komarek, Jaromir: *See*—
Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.
Komatu, Kisao, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Tape-mounted electronic-component package. 4,108,305, Cl. 206-330.000.
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, to Canon Kabushiki Kaisha. Feeding device. 4,108,427, Cl. 271-9.000.
Kondo, Kenichi, to Kabushiki Kaisha Daini Seikosha. Electronic watch having an alarm means. 4,107,916, Cl. 58-38.00R.
Kondo, Tsuneyuki; and Kuroda, Akio, to Toray Industries, Inc. Process for preparing cycloalkanone oximes. 4,108,895, Cl. 260-566.00A.
Kondo, Yutaka; and Nishina, Shuho, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt system. 4,108,471, Cl. 280-747.000.
Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, to Bayer Aktiengesellschaft. Preparation of polyurethane ureas using as hardeners mixtures of water, amines, aldimines and ketimines. 4,108,842, Cl. 528-61.000.
Konig, Franz: *See*—
Fehrer, Ernst; Fuchs, Helmut; and Konig, Franz, 4,107,909, Cl. 57-5.000.
Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine having an auxiliary combustion chamber without an intake valve. 4,108,133, Cl. 123-191.00S.
Konishiroku Photo Industry Co., Ltd.: *See*—
Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.
Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eiichi; and Ishikawa, Hidehiko, 4,108,668, Cl. 96-135.000.
Kontekla Oy: *See*—
Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, 4,107,929, Cl. 61-14.000.
Kontsevaya, Evgenia Markovna: *See*—
Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.
Kontz, Robert F., to Owens-Illinois, Inc. Extrusion head. 4,108,590, Cl. 425-466.000.
Kopp, Edward L.; Meyer, Paul A.; and Sabol, James N., to Krautkramer-Branson, Incorporated. Transducer probe for pulse-echo ultrasonic exploration. 4,108,165, Cl. 128-2.00V.
Koppers Company, Inc.: *See*—
Dressler, Hans, 4,108,907, Cl. 260-610.00B.
Gerber, Donald Joel, 4,108,733, Cl. 202-267.00A.
Korosec, Rudolph Francis: *See*—
Cable, Walter Lester; Binge, Derek Sidney; and Korosec, Rudolph Francis, 4,108,407, Cl. 248-23.000.
Kosaka, Katuaki; and Ueno, Zene, to Nissan Motor Company, Limited. Fuel reformer for generating gaseous fuel containing hydrogen and/or carbon monoxide. 4,108,114, Cl. 123-3.000.

Koshkin, Lev Nikolaevich: *See—*
Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich, 4,107,977, Cl. 73-45.300.
Koski, Gerald L.: *See—*
Brown, Donald A.; LaLonde, Paul D.; and Koski, Gerald L., 4,108,563, Cl. 403-347.000.
Kottmann, Alfred: *See—*
Dangelmaier, Karl; and Kottmann, Alfred, 4,108,031, Cl. 83-90.000.
Kovach, Leslie J. Method and apparatus for producing double-walled thermoplastic pipe. 4,108,703, Cl. 156-244.130.
Kozima, Akio: *See—*
Ohta, Masafumi; Hashimoto, Mitsuru; and Kozima, Akio, 4,108,656, Cl. 96-1.50R.
Kozy, Nikolai Mikhailovich: *See—*
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.
Kracklauer, Aloysius C., to Sparkler Filters, Inc. Solar energy powered heat generator. 4,108,158, Cl. 126-271.000.
Kraft, Inc.: *See—*
Collard, James C.; and Martin, Wesley G., 4,108,562, Cl. 403-254.000.
Krasny, Louis M.: *See—*
England, Alfred W.; Krasny, Louis M.; and Narey, Edward F., 4,109,310, Cl. 364-200.000.
Krassig, Johannes: *See—*
Sasshofer, Franz; Gotschy, Friedrich; Krassig, Johannes; and Wimmer, Adalbert, 4,107,827, Cl. 28-246.000.
Kratel, Gunter; Muhlhofer, Ernst; and Schreiner, Franz, to Wacker-Chemie GmbH. Process for the manufacture of silicon dioxide. 4,108,964, Cl. 423-336.000.
Krause, Stephen R. Universal mark sense betting terminal system and method. 4,108,361, Cl. 235-375.000.
Krauss u. Reichert GmbH & Co. KG Spezialmaschinenfabrik: *See—*
Jung, Rolf, 4,107,839, Cl. 30-123.300.
Krautkramer-Branson, Incorporated: *See—*
Kopp, Edward L.; Meyer, Paul A.; and Sabol, James N., 4,108,165, Cl. 128-2.00V.
Kravitz, Stanley: *See—*
Estes, John H.; Kravitz, Stanley; and Brandenburg, John T., 4,108,218, Cl. 141-1.000.
Kreyenbuhl, Armand, to Adidas Fabrique de Chaussures de Sport. Ski binding. 4,108,467, Cl. 280-615.000.
Krieg, Martin; and Olffers, Theo, to Hoechst Aktiengesellschaft. Process for reducing the mercury content of industrial waste waters. 4,108,769, Cl. 210-50.000.
Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., to Continental Group, Inc., The. Ribbed bottom structure for plastic container. 4,108,324, Cl. 215-1.00C.
Kropac, Joseph M., to Xerox Corporation. Method of making a thermo active imaging member. 4,108,655, Cl. 96-1.50R.
Kropiwnicki, Tadek M.: *See—*
Miller, Kenneth H.; and Kropiwnicki, Tadek M., 4,108,581, Cl. 417-363.000.
Krouse, Robert S. Portable switch and dimmer control console. 4,109,231, Cl. 338-200.000.
Kroy Industries, Inc.: *See—*
Connoy, Thomas Patrick, 4,108,556, Cl. 400-48.000.
Krueger, Lynn A. Mobile home skirting. 4,107,888, Cl. 52-169.120.
Kruger, Arthur: *See—*
Gauss, Wilhelm; Van Logten, Henrious; and Kruger, Arthur, 4,108,048, Cl. 91-6.500.
Krum, Jack Kern: *See—*
Rucker, Dugan Allan; Wollermann, Louis Albert; and Krum, Jack Kern, 4,109,023, Cl. 426-549.000.
Krupp, Walter H. Precompressed piping system for handling cryogenic fluid. 4,108,476, Cl. 285-47.000.
Kruschwitz, Werner: *See—*
Andrzejewski, Heinz; Kruschwitz, Werner; and Bright, Robert G., 4,107,898, Cl. 52-716.000.
Kubis, Heribert, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Arrangement for external oiling of cylinder liners of internal combustion engines. 4,108,135, Cl. 123-196.00R.
Kubo, Masayoshi; and Katayama, Hideaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Filter press. 4,108,776, Cl. 210-224.000.
Kuboshima, Makoto: *See—*
Fujita, Susumu; Hamada, Yoichi; and Kuboshima, Makoto, 4,109,260, Cl. 354-106.000.
Kubota, Nobunori: *See—*
Yamana, Makoto; and Kubota, Nobunori, 4,107,911, Cl. 57-56.000.
Kubrin, Michael Joseph: *See—*
Pohto, Gerald R.; and Kubrin, Michael Joseph, 4,108,752, Cl. 204-256.000.
Kudsia, Chandra Mohan; Moody, Harry John; and Keyes, Lorne Allan, to RCA Corporation. Traffic switching in communications satellites. 4,109,202, Cl. 325-3.000.
Kuge, Tsukasa; and Tanigawa, Koichi, to Canon Kabushiki Kaisha. Corona discharger. 4,109,289, Cl. 361-230.000.
Kuhn, Charles J. Method for straightening automobile bodies. 4,107,974, Cl. 72-457.000.
Kuhn, Max: *See—*
Ruegger, Artur; and Kuhn, Max, 4,108,985, Cl. 424-177.000.
Kume, Tosiaki: *See—*
Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.
Kunise, Satoru: *See—*
Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, 4,109,157, Cl. 250-531.000.
Kunze, Dieter: *See—*
von Allworden, Wilhelm; and Kunze, Dieter, 4,108,464, Cl. 280-508.000.
Kunzel, Hans Egon: *See—*
Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,108,936, Cl. 264-78.000.
Kupperman, Dennis: *See—*
Kupperman, Sam; and Kupperman, Dennis, 4,107,840, Cl. 30-172.000.
Kupperman, Sam; and Kupperman, Dennis, 4,108,104, Cl. 116-148.000.
Kupperman, Sam; and Kupperman, Dennis, to Rub-A-Venture. Abrasive hand covering. 4,107,840, Cl. 30-172.000.
Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. One piece plastic molded structural unit and door knocker constructed therefrom. 4,108,104, Cl. 116-148.000.
Kurchacova, Elva: *See—*
Buckler, Robert Thomas; and Kurchacova, Elva, 4,109,001, Cl. 424-269.000.
Kurita Machinery Manufacturing Co., Ltd.: *See—*
Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, 4,108,777, Cl. 210-225.000.
Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, to Kurita Machinery Manufacturing Co., Ltd. Filter press. 4,108,777, Cl. 210-225.000.
Kurnosov, Anatoly Ivanovich: *See—*
Belenkov, Nikolai Mikhailovich; Kurnosov, Anatoly Ivanovich; and Malitsky, Evgeny Efremovich, 4,109,274, Cl. 357-38.000.
Kuroda, Akio: *See—*
Kondo, Tsuneyuki; and Kuroda, Akio, 4,108,895, Cl. 260-566.00A.
Kuroda, Hiroshi: *See—*
Matsuda, Tamotsu; and Kuroda, Hiroshi, 4,108,376, Cl. 237-12.30A.
Kurz, Craven H. Orthodontic appliance. 4,107,844, Cl. 32-14.00A.
Kusakawa, Norihisa: *See—*
Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, 4,108,946, Cl. 260-881.000.
Kuwertz, Erich, to Pfalzstahlbau GmbH. Coupling apparatus on a circulating tow conveyor. 4,108,078, Cl. 104-172.00S.
Kvaerna, Sverre: *See—*
Lindstroem, Harry; and Kvaerna, Sverre, 4,108,426, Cl. 269-328.000.
Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., to Bethlehem Steel Corporation. Process for the distillation of weak ammonia liquor. 4,108,734, Cl. 203-7.000.
Kwasnoski, Daniel: *See—*
Burcaw, Kenneth R., Jr; Kwasnoski, Daniel; and Rudzki, Eugene M., 4,108,735, Cl. 203-7.000.
Kwon, Joon T.: *See—*
Sze, Morgan C.; Gelbein, Abraham P.; and Kwon, Joon T., 4,108,761, Cl. 208-254.00H.
L. B. (Plastics) Limited: *See—*
Litchfield, Leon George, 4,108,520, Cl. 312-330.00R.
L. Schuler GmbH: *See—*
Bareis, Alfred; Dangelmaier, Karl; and Braun, Reinhard, 4,108,320, Cl. 214-8.000.
Dangelmaier, Karl; and Kottmann, Alfred, 4,108,031, Cl. 83-90.000.
La Soudure Electrique Autogene, Procedes Arcos: *See—*
De Haeck, Robert, 4,109,059, Cl. 428-558.000.
Labaz: *See—*
Pigerol, Charles; de Fillain, Paul de Cointet; Grain, Claude; and Le Blay, Jacques, 4,108,865, Cl. 260-329.00R.
Labuda, Edward Franklin: *See—*
Bindell, Jeffrey Bruce; Labuda, Edward Franklin; and Moller, William Michael, 4,107,835, Cl. 29-590.000.
Laing, Nikolaus. Rail vehicles with propulsion energy recovery system. 4,108,077, Cl. 104-156.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, 4,108,693, Cl. 148-16.500.
Lake, Malcolm John; and Snelgrove, William Richard Noble, to Johns-Manville Corporation. Process for recovering platinum group metals from ores also containing nickel, copper and iron. 4,108,639, Cl. 75-101.00R.
La Liberte, Norman U., to American Optical Corporation. Colorless allyl diglycol carbonate. 4,108,827, Cl. 260-42.210.
LaLonde, Paul D.: *See—*
Brown, Donald A.; LaLonde, Paul D.; and Koski, Gerald L., 4,108,563, Cl. 403-347.000.
Lamb, Richard C.; and Iwans, Robert C., to Koehler-Dayton, Inc. Self-contained toilet. 4,107,798, Cl. 4-321.000.
Lambert, Bertha E.: *See—*
Lambert, Steven J.; Lambert, Bertha E.; and Lambert, Warren G., 4,108,778, Cl. 210-297.000.
Lambert, Everette M., to Liberty Vinyl Corporation. Waterbed and frame with pliant supporting sides. 4,107,799, Cl. 5-370.000.
Lambert, Gerard Edouard; and Begis, Roger, to Seveg, S.A. Ink agitator. 4,108,068, Cl. 101-363.000.

Lambert, James Hubert: *See—*
Rombach, Joseph Xavier; and Lambert, James Hubert, 4,108,409, Cl. 248-96.000.
Lambert, Steven J.; Lambert, Bertha E.; and Lambert, Warren G. Self-cleaning filter and vortexer. 4,108,778, Cl. 210-297.000.
Lambert, Warren G.: *See—*
Lambert, Steven J.; Lambert, Bertha E.; and Lambert, Warren G., 4,108,778, Cl. 210-297.000.
Lampe, Hans Hermann: *See—*
Beismann, Walter; Lampe, Hans Hermann; and Pohle, Werner, 4,108,360, Cl. 235-304.000.
Lamy, Jacques Edouard, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris". Apparatus and method for towing a pipeline in a body of water. 4,107,933, Cl. 61-107.000.
Landau, John Vernon, Jr.; and Rupinski, Frederick Alexander, to Singer Company, The. Programmable variable speed for sewing machine. 4,108,090, Cl. 112-121.110.
Lander, Lars Bengt, to Cepasy AG. Paper dispenser, especially toilet paper dispenser. 4,108,513, Cl. 312-39.000.
Landfors, Arthur A., to Varian Associates, Inc. Low cost, thermally efficient diffusion pump. 4,108,576, Cl. 417-153.000.
Lang, James R., to Mechanex Corporation, The. Automatic oil level maintaining system. 4,107,999, Cl. 73-326.000.
Lang, James R., to Mechanex Corporation, The. Sensing probe for gravity induced flow liquid level regulator. 4,108,201, Cl. 137-393.000.
Lang, Milton R., Jr.; and O'Berry, William A., to Westinghouse Electric Corp. PRF Detection system and method. 4,109,197, Cl. 324-78.00F.
Langbein, Dieter: *See—*
Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, 4,108,620, Cl. 55-210.000.
Lange, Georg, to Thyssen Purofer GmbH. Method of the direct reduction of iron ore. 4,108,636, Cl. 75-35.000.
Langen, Hans: *See—*
Joekel, Alfred; Langen, Hans; and Denner, Peter, 4,107,832, Cl. 29-157.3AH.
Langer, Arthur W., Jr., to Exxon Research & Engineering Co. Process for polymer lithiation in graft polymerization. 4,108,921, Cl. 260-827.000.
Langeron, Jean-Paul: *See—*
Fustier, Geraud; Langeron, Jean-Paul; de la Bastie, Joseph; and Carlizza, Jean, 4,108,650, Cl. 75-206.000.
Langguth, Robert P.: *See—*
Christ, Thomas; and Langguth, Robert P., 4,108,801, Cl. 252-544.000.
Lantto, Joseph R. Squeegee with moisture removing means. 4,107,812, Cl. 15-245.000.
Larkin, William A.: *See—*
Bouchoux, Jean W.; and Larkin, William A., 4,108,828, Cl. 260-45.75H.
Larsen, Tor Grotnes: *See—*
Typpo, Pekka Matti; Wennerberg, Gunnar; and Larsen, Tor Grotnes, 4,107,847, Cl. 33-147.00L.
Lashko, Nikolai Fedorovich: *See—*
Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.
Latash, Jury Vadimovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
Lau, Philip Thiam Shin: *See—*
Fields, Donald Lee; Henzel, Richard Paul; Lau, Philip Thiam Shin; and Chasman, Richard Allan, 4,108,850, Cl. 260-162.000.
Lauck, Robert M., to Stauffer Chemical Company. Protein enriched baked goods. 4,109,025, Cl. 426-551.000.
Lavalier, Clair H. Snowmobile flotation ski. 4,108,453, Cl. 280-28.000.
Law, Chi Y. Camera for taking three dimensional photographs. 4,109,261, Cl. 354-112.000.
Law, Chi Y. Three dimensional camera having lenticular screen moving apparatus. 4,109,262, Cl. 354-112.000.
Lawson, Joseph M. Variable torque fluid device. 4,108,049, Cl. 91-478.000.
Lawson, Michael B.; and Snyder, Kenneth J., to Halliburton Company. Method for dissolving asphaltic material. 4,108,681, Cl. 134-20.000.
Le Materiel Telephonique: *See—*
Bougon, Pierre Paul Andre, 4,107,854, Cl. 35-25.000.
Leach, Bruce Eugene; and Starks, Charles M., to Continental Oil Company. N-alkylated cresylic acids via direct alkylation in a liquid phase. 4,108,909, Cl. 568-766.000.
Lear Siegler, Inc.: *See—*
Frankiw, Walter, 4,108,047, Cl. 90-1.60R.
Le Blay, Jacques: *See—*
Pigerol, Charles; de Fillain, Paul de Cointet; Grain, Claude; and Le Blay, Jacques, 4,108,865, Cl. 260-329.00R.
Le Bossenec, Raymond: *See—*
L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, 4,108,693, Cl. 148-16.500.
Leco Corporation: *See—*
Lunde, Marvin C., 4,108,339, Cl. 222-591.000.
Lee, Cheng H., to Monsanto Company. Membrane separation of methanol from formaldehyde aqueous mixtures. 4,108,765, Cl. 210-23.00R.
Lee, Gim Fun, Jr., to General Electric Company. Thermoplastic molding compositions of rubber modified copolymers of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride. 4,108,925, Cl. 260-876.00R.
Lee, Henry L., Jr.; and Orlowski, Jan Alexander, to Lee Pharmaceuticals. Dental adhesive composites. 4,107,845, Cl. 32-15.000.
Lee, James Y.: *See—*
Ogle, James A.; and Lee, James Y., 4,109,180, Cl. 315-169.0TV.
Lee, Maw Huei, to Clopay Corporation. Garage door operator and door obstruction sensing apparatus. 4,107,877, Cl. 49-28.000.
Lee Pharmaceuticals: *See—*
Lee, Henry L., Jr.; and Orlowski, Jan Alexander, 4,107,845, Cl. 32-15.000.
Lee, Soo-Il, to Owens-Illinois, Inc. Injection molding method and apparatus. 4,108,956, Cl. 264-329.000.
Lee, Yoon C., to Monsanto Company. Rubber modified fire retardant polymer compositions. 4,108,943, Cl. 260-878.00R.
Leeke, Wallace Richard: *See—*
Newland, Robert Andrew; and Leeke, Wallace Richard, 4,107,806, Cl. 9-310.00E.
Leemhuis, Louis J. Damper control device. 4,108,371, Cl. 236-49.000.
Legey, Elso Jose Figueira. Tape machine and slide projector synchronizing device. 4,109,285, Cl. 360-80.000.
LeGrady, Carl F. Reinforcing bar locating means. 4,107,895, Cl. 52-687.000.
Leibrock, Kurt, to Saarbergwerke Aktiengesellschaft. Method of and apparatus for compacting coking coal. 4,108,610, Cl. 44-10.00G.
Leifheit Internationl Guenter Leifheit GmbH: *See—*
Schuelein, Rolf G.; and Friedrich, Rainer, 4,107,809, Cl. 15-42.000.
Leigh, Roland Albert, to BOC Limited. Compositions containing dithionites. 4,108,960, Cl. 423-265.000.
Leistner, Rudolf, to Braun AG. Camera for motion and still pictures. 4,108,543, Cl. 352-121.000.
Leites, Abram Vladimirovich: *See—*
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.
Leitzel, Larry Leon: *See—*
Douty, George Harold; Lucius, John Edward; and Leitzel, Larry Leon, 4,108,527, Cl. 339-107.000.
Lembke, Russell B.: *See—*
Anderson, Hugh C.; and Lembke, Russell B., 4,108,826, Cl. 260-395.00B.
Lenhard, Robert Herman: *See—*
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,108,890, Cl. 260-507.00R.
Lenker, Paul E., to Davenport Tool Co. Ratchet wrench with double swivelling drive shaft. 4,108,027, Cl. 81-60.000.
Le Noane, Georges E.; Mathern, Andre M.; and Morizur, Gabrielle. Apparatus for on-site connection of cables with optical fibres. 4,108,534, Cl. 350-96.210.
Lerg, George: *See—*
Nelson, David H., 4,108,154, Cl. 126-270.000.
Lermann, Peter: *See—*
Stemme, Otto; Lermann, Peter; and Winkler, Alfred, 4,108,542, Cl. 352-72.000.
Lermer Apparatebau GmbH: *See—*
Liebscher, Guenther; and Christ, Guenter, 4,108,082, Cl. 105-464.000.
Lesh, Nathan George, deceased; by Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, to Bell Telephone Laboratories, Incorporated. Conduction system for thin film and hybrid integrated circuits. 4,109,297, Cl. 361-402.000.
Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. Preparation of 2-(pyridinyl)-4-pyrimidinamines. 4,109,092, Cl. 544-328.000.
Lettau, W. Fred, to Abex Corporation. Tapered block thickness gauge. 4,107,849, Cl. 33-174.00E.
Leuck, Steven M.: *See—*
Anderson, Gordon K.; Leuck, Steven M.; and Ruhl, Gary L., 4,108,026, Cl. 81-3.00R.
Leventhall, Hubert Geoffrey: *See—*
Coxon, Brian; and Leventhall, Hubert Geoffrey, 4,109,108, Cl. 179-1.00P.
Leverone, Paul G.: *See—*
Ball, Raymond L.; Leverone, Paul G.; and Biegler, Warren H., 4,109,199, Cl. 324-202.000.
Lewin, Nathan: *See—*
Wegfahrt, Paul F.; Lewin, Nathan; and Monthony, James F., 4,108,974, Cl. 424-1.000.
Lewis, Charles W.: *See—*
Cherenko, Joseph; and Lewis, Charles W., 4,109,055, Cl. 428-437.000.
Lewis, Ronald A.: *See—*
Rowe, Charles L.; and Lewis, Ronald A., 4,108,002, Cl. 73-371.000.
L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method for the heat-treatment of steel and for the control of said treatment. 4,108,693, Cl. 148-16.500.
Li, George S., to Standard Oil Company, The. Polymerizates of olefinic nitriles containing indene. 4,109,073, Cl. 526-280.000.

Liautaud, James P., to American Antenna Corporation. Precision injection-molded coil form and method and apparatus for manufacture. 4,109,224, Cl. 336-192.000.

Libbey-Owens-Ford Company: *See*—
Marriott, James G., 4,109,044, Cl. 428-210.000.

Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., to Carrier Corporation. Method for loading refuse into containers. 4,108,261, Cl. 177-120.000.

Liberty Vinyl Corporation: *See*—
Lambert, Everette M., 4,107,799, Cl. 5-370.000.

Liebscher, Guenther; and Christ, Guenter, to Lermer Apparatebau GmbH. Container locking device. 4,108,082, Cl. 105-464.000.

Lieser, Karl Heinrich; and Burba, Peter, to Riedel-de Haen Aktiengesellschaft. Ion exchange compounds on cellulose basis and process for the manufacture thereof. 4,109,080, Cl. 536-43.000.

Lightning Fasteners Limited: *See*—
Parsons, John T., 4,107,956, Cl. 66-195.000.

Ligman, James Raymond; and Jones, Richard Fred. Recorder for decompression data. 4,107,995, Cl. 73-300.000.

Lileck, John Theodore, to Air Products & Chemicals, Inc. Preparation of iodine pentafluoride by direct fluorination of molten iodine. 4,108,966, Cl. 423-466.000.

Lincoln, Thomas Christopher, to Microdot Inc. Hermaphroditic edgeboard connectors. 4,108,525, Cl. 339-49.00R.

Lindal, Sir Walter. Prefabricated roof section. 4,107,885, Cl. 52-90.000.

Linde Aktiengesellschaft: *See*—
Abels, Theodor, 4,108,265, Cl. 180-66.00R.
Chmiel, Horst, 4,107,937, Cl. 62-64.000.

Linden-Alimak AB: *See*—
Johansson, Ake, 4,108,254, Cl. 173-43.000.

Lindgren, Osten, to AB Metall & Bergprodukter. Apparatus for recovery of re-usable substances from a fixing bath in processes for development and fixing of photographic films and X-ray films. 4,108,753, Cl. 204-263.000.

Lindsley, Charles Wesley: *See*—
Shambelan, Robert Charles; and Lindsley, Charles Wesley, 4,108,323, Cl. 214-310.000.

Lindstroem, Harry; and Kvaerna, Sverre, to Siemens Aktiengesellschaft. Device for holding the head of a patient. 4,108,426, Cl. 269-328.000.

Lindstrom, Karl Olof, to Karlskronavarvet AB. Anchorable, floating platform. 4,108,102, Cl. 114-264.000.

Lippert, Irving S.: *See*—
Pizzuti, Donato F.; and Lippert, Irving S., 4,109,264, Cl. 354-187.000.

Lipperts, Joseph H. F. G., to Hazemeijer B.V. Vacuum switch with intermittently energized electromagnetic coil. 4,109,122, Cl. 200-144.00B.

Lipperts, Joseph H. F. G., to Hazemeijer B.V. Vacuum switch. 4,109,123, Cl. 200-144.00B.

Litchfield, Leon George, to L. B. (Plastics) Limited. Drawers. 4,108,520, Cl. 312-330.00R.

Litton Industrial Products, Inc.: *See*—
Wayson, Andrew J., 4,107,913, Cl. 57-125.000.

Liu, Robert Chung-Huan; and Hughes, John Lawrence, to Armour Pharmaceutical Company. Pharmaceutical, compositions containing substituted 4'-hydroxyphenyl guanidines and methods of using same. 4,109,014, Cl. 424-326.000.

Lloyd, Gary Richard; and Lloyd, Rita Rae. Artificial Christmas tree. 4,109,036, Cl. 428-8.000.

Lloyd, Peter Frederick Victor. Pipe coupling socket assemblies. 4,108,446, Cl. 277-101.000.

Lloyd, Rita Rae: *See*—
Lloyd, Gary Richard; and Lloyd, Rita Rae, 4,109,036, Cl. 428-8.000.

Lochel, Frank P., Jr., to Amchem Products, Inc. Autodeposited coatings. 4,108,817, Cl. 260-29.60E.

Long, Everett James; and Muench, Elmer W., to Everett/Charles, Inc. Probe actuator assembly. 4,108,528, Cl. 339-117.00P.

Longoni, Angelo: *See*—
Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.

Loper, Dall D.: *See*—
Ozdemir, Faik S.; and Loper, Dall D., 4,109,029, Cl. 427-84.000.

Lord Corporation: *See*—
Clinard, Ralph L., Jr., 4,108,508, Cl. 308-238.000.

L'Oreal: *See*—
Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., 4,108,185, Cl. 401-88.000.

Lorenz, Gunter: *See*—
Reinehr, Ulrich; Nogaj, Alfred; and Lorenz, Gunter, 4,108,845, Cl. 526-240.000.

Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, to Richter Gedeon Vegyeszeti Gyar Rt. (−)-Apovincaminol lauric acid ester and cerebral vasodilatory composition thereof. 4,108,996, Cl. 424-256.000.

Loshaek, Samuel; and Shen, Chah M., to Wesley-Jessen Inc. Method of producing optically clear hydrophilic copolymers and contact lenses. 4,109,070, Cl. 526-77.000.

Loughlin, James Osborn E.: *See*—
Mueller, Klaus Karl; and Loughlin, James Osborn E., 4,108,597, Cl. 8-115.000.

Loughran, Gerard A.: *See*—
Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., 4,108,926, Cl. 260-874.000.

Love, William D.; and Hueschen, Robert E., to General Electric Company. X-ray tube anode with alloyed surface and method of making the same. 4,109,058, Cl. 428-553.000.

Loveland, Malcolm W., to Atlas Pacific Engineering Company. Method and means for peeling pineapples. 4,108,059, Cl. 99-543.000.

Loveland, Malcolm W., to Atlas Pacific Engineering Company. Method and means for peeling pineapples. 4,108,060, Cl. 99-591.000.

Loveland, Malcolm W., to Atlas Pacific Engineering Company. Method of peeling pineapples. 4,109,021, Cl. 426-482.000.

Lowe, James H. C.: *See*—
Walberg, M. Victor; and Lowe, James H. C., 4,108,644, Cl. 75-135.000.

Lowe, James L.: *See*—
Wendel, Ion L., 4,108,159, Cl. 126-271.000.

Lowery, Louie Russell, to Keyes Fibre Company. Automatic packing. 4,108,321, Cl. 214-8.50A.

LTG Lufttechnische GmbH: *See*—
Furstenberg, Joachim; and Hencke, Dietmar, 4,107,910, Cl. 57-34.00R.

Lubrizol Corporation, The: *See*—
Bryant, Charles Peterson, 4,108,784, Cl. 252-56.00R.
Ripple, David Eugene, 4,108,783, Cl. 252-54.600.

Lucas Electrical Company, Limited: *See*—
Williams, Malcolm; and Jones, Christopher Robin, 4,108,115, Cl. 123-32.0EB.

Lucas Industries Limited: *See*—
Andrew, Gordon Edward; and Bunn, George Edward, 4,107,918, Cl. 60-39.710.
Hodgson, Duncan Barry, 4,109,174, Cl. 310-316.000.
Warner, Peter Stuart; and Bicht, John Richard, 4,109,064, Cl. 429-66.000.

Lucius, John Edward: *See*—
Douty, George Harold; Lucius, John Edward; and Leitzel, Larry Leon, 4,108,527, Cl. 339-107.000.

Luithlen, Heinz: *See*—
Schmidt, Manfred; and Luithlen, Heinz, 4,108,465, Cl. 280-605.000.

Lummus Company, The: *See*—
Sze, Morgan C.; Gelbein, Abraham P.; and Kwon, Joon T., 4,108,761, Cl. 208-254.00H.
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Lunde, Marvin C., to Leco Corporation. Integral nozzle with gas delivery manifold. 4,108,339, Cl. 222-591.000.

Lunden, Risto Waldemar: *See*—
Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, 4,107,929, Cl. 61-14.000.

Lunsford, Carl D.; and Alphin, Reevis S., to A. H. Robins Company, Inc. Method of increasing rate of gastric emptying with pyrrolidinylbenzamides. 4,109,005, Cl. 424-274.000.

Lussier, Michel, to Automobiles Peugeot and Hautrifil. Clamping collar. 4,107,824, Cl. 24-27.000.

Luthe, Fred J.; and Hays, Allen E., to Fisher Controls Company. Control valve trim assembly. 4,108,210, Cl. 138-42.000.

Lynch, Paul E., to Fenix & Scisson, Inc. Means to prevent relative rotation of threaded together pin and box tool joints. 4,108,478, Cl. 285-82.000.

Lyon, Floyd A.; and Harrison, Henry, to Halm Instrument Co., Inc. Heat storage water tank. 4,108,374, Cl. 237-1.00A.

M. L. Engineering (Plymouth) Limited: *See*—
Moorey, Ernest James, 4,109,205, Cl. 325-45.000.

M&T Chemicals Inc.: *See*—
Bouchoux, Jean W.; and Larkin, William A., 4,108,828, Cl. 260-45.75H.

MacAfee, James Edwin; Winkler, John W.; and Budde, Karl, to Jeep Corporation. Transfer case. 4,108,021, Cl. 74-606.00R.

Macaluso, Salvatore. Oil salvager. 4,108,773, Cl. 210-122.000.

MacArthur, Judy Anne: *See*—
Scott, Walter Norris; and MacArthur, Judy Anne, 4,107,818, Cl. 17-51.000.

MacDougall, James B. Adjustable antenna mounting bracket. 4,109,251, Cl. 343-715.000.

Mack, Kenneth John: *See*—
Anderson, Clifford Wilhelm; Mack, Kenneth John; and Martin, Jerry Thomas, 4,108,939, Cl. 264-129.000.

MacKeigan, Thomas H., to Abex Corporation. Eyelet removing punch. 4,107,842, Cl. 30-358.000.

MacKinnon, Richard B. Auto anti-theft device. 4,107,962, Cl. 70-243.000.

Madera, Anthony J.: *See*—
Bates, Albert M.; Sandford, Wayne H., Jr.; and Madera, Anthony J., 4,109,232, Cl. 340-6.00R.

Madsen, Kristian Dahl, to ASEA Aktiebolag. Gaseous mixture ultracentrifuge. 4,108,354, Cl. 233-30.000.

Maeda, Naoyuki: *See*—
Kaji, Isamu; and Maeda, Naoyuki, 4,109,167, Cl. 307-270.000.

Maeda, Tooru: *See*—
Yamamoto, Kenichi; Hirose, Yutaka; and Maeda, Tooru, 4,108,137, Cl. 123-242.000.

Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. Compounds of ergolene and ergoline structure and method for the preparation thereof. 4,108,855, Cl. 260-285.500.

Mahajan, Gautam K.: *See*—
Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.

Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, to Perkin-Elmer Corporation, The. Diluting and dispensing probe for blood sample preparation. 4,108,608, Cl. 23-259.000.

Mahone, Louis G., to Dow Corning Corporation. Method of preparing methylsiloxanes and methylchloride. 4,108,882, Cl. 260-448.20E.

Mahrt, Gunter; and Goldammer, Georg, to Schubert & Salzer. Device for opening and mixing fiber bales. 4,107,820, Cl. 19-81.000.

Main, W. Eric, to Motorola, Inc. Unbalanced-to-balanced signal converter circuit. 4,109,214, Cl. 330-254.000.

Makabe, Hachiro: *See—*
Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.

Malec, Jerry P. Modulator valve. 4,108,134, Cl. 123-196.00R.

Malec, Robert E., to Ethyl Corporation. Polyolefin quaternary pyridinium salts. 4,108,858, Cl. 260-294.80E.

Malichenko, Evgeny Fedorovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Malitsky, Evgeny Efremovich: *See—*
Belenkov, Nikolai Mikhailovich; Kurnosov, Anatoly Ivanovich; and Malitsky, Evgeny Efremovich, 4,109,274, Cl. 357-38.000.

Mallinckrodt, Inc.: *See—*
Smith, Kenneth R., 4,109,081, Cl. 536-53.000.

Malroit, Richard R. Collapsible grapple. 4,108,484, Cl. 294-66.00R.

Mamo, Anthony C.: *See—*
Vary, Robert F.; and Mamo, Anthony C., 4,108,238, Cl. 165-57.000.

Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, to Fuji Electric Co., Ltd.; and Japanese National Railways. Current collector shoe suspension for externally powered electric vehicle. 4,108,288, Cl. 191-49.000.

Manganaro, George Frank. Electromagnetic stapler and safety trigger therefor. 4,108,345, Cl. 227-131.000.

Mangel, Karl. Master operator for vertically moving elevator car doors. 4,108,283, Cl. 187-52.0LC.

Manion, Francis M.: *See—*
Drzewiecki, Tadeusz M.; and Manion, Francis M., 4,108,721, Cl. 176-36.00R.

Manley, Paul P., Jr. Lock for stacked materials. 4,107,958, Cl. 70-58.000.

Manno, Joseph T. Knotless minnow rig. 4,107,866, Cl. 43-44.830.

Manufacturers Systems, Inc.: *See—*
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,108,212, Cl. 138-122.000.

Mao, Chung-Ling, to Uniroyal, Inc. 3-(Hydroxyhydrocarbylsecondaryamino)thiophene 1,1-dioxides and polyurethanes chain extended therewith. 4,108,868, Cl. 260-332.100.

Marcell, William B., to Thomas Industries of Tennessee, Inc. Dispenser and method for applying lubricant or other material to the interior of a conduit. 4,108,279, Cl. 184-15.00R.

Marchal, Gerard: *See—*
Chielens, Alain; Marchal, Gerard; and Gesquiere, Michel, 4,108,410, Cl. 248-130.000.

Marchenko, Ivan Konstantinovich: *See—*
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.

Marconi Company Ltd., The: *See—*
Woloszczuk, Edmund Wergiliusz, 4,109,254, Cl. 343-797.000.

Marcoux, Leo; and Berg, Peter G., to Texas Instruments Incorporated. High efficiency early fuel evaporation carburetion system. 4,108,125, Cl. 123-122.00F.

Margavio, Matthew F.: *See—*
Portnoy, Norman A.; Arthur, Jett C., Jr.; Margavio, Matthew F.; and Nelson, Marie C., 4,108,748, Cl. 204-159.120.

Margen, Peter Heinrich Erwin; and Naslund, Rolf Paul, to Aktiebolaget Atomenergi. Heat exchanger system. 4,108,240, Cl. 165-125.000.

Marin, Jose Antonio T. Foldable chair. 4,108,490, Cl. 297-42.000.

Marion L. Eakes Company: *See—*
Eakes, Marion L., 4,108,051, Cl. 115 LH-.

Marion Laboratories, Inc.: *See—*
Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.

Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Polycarbonate composition containing oligomeric-polymeric oxalate plasticizer. 4,108,820, Cl. 260-30.80R.

Mark, Victor; and Wilson, Phillip Steven, to General Electric Company. Polycarbonate composition containing iminated and thionated carbonate plasticizers. 4,108,821, Cl. 260-30.80R.

Marriott, James G., to Libbey-Owens-Ford Company. Electrically heated window having sharply bent portions. 4,109,044, Cl. 428-210.000.

Marscher, William D., to United Technologies Corporation. Stress relief of metal-ceramic gas turbine seals. 4,109,031, Cl. 427-191.000.

Marshall, David William: *See—*
Owen, Edwin Lewis; and Marshall, David William, 4,109,028, Cl. 427-58.000.

Marshall, Robert Moore; and Dardoufas, Kimon Constantine, to Allied Chemical Corporation. Production of polyester tire yarn. 4,108,781, Cl. 252-8.900.

Marsham, Peter Robert, to Imperial Chemical Industries Limited. Prostane derivatives. 4,109,015, Cl. 424-341.000.

Martensson, Karl J. G.: *See—*
Sjoholm, Claes Bertil; and Martensson, Karl J. G., 4,108,058, Cl. 99-466.000.

Martin Industries, Inc.: *See—*
Wilhoite, Murray O., 4,108,144, Cl. 126-120.000.

Martin, Jerry Thomas: *See—*
Anderson, Clifford Wilhelm; Mack, Kenneth John; and Martin, Jerry Thomas, 4,108,939, Cl. 264-129.000.

Martin, Lee D. Bicycle seat and mounting therefor. 4,108,462, Cl. 280-289.00E.

Martin, R. Hugo; and Owens, William F., Jr., to Olin Corporation. Gamma alumina filled paper wrapper for smoking articles. 4,108,151, Cl. 131-9.000.

Martin, Robert Arthur: *See—*
Hoff, Carl Preston; and Martin, Robert Arthur, 4,108,335, Cl. 222-137.000.

Martin, Roger J. Solar tracking device. 4,108,019, Cl. 74-469.000.

Martin, Terence Geoffrey: *See—*
Williams, Derek Farnham; and Martin, Terence Geoffrey, 4,108,760, Cl. 208-11.0LE.

Martin, Wayne A., to United States Steel Corporation. Dies for forging and trepanning large diameter couplings and method of forging and trepanning couplings. 4,107,972, Cl. 72-334.000.

Martin, Wesley G.: *See—*
Collard, James C.; and Martin, Wesley G., 4,108,562, Cl. 403-254.000.

Martin, William E., to United States of America, Navy. Method of making miniature coupling lens. 4,108,622, Cl. 65-30.00R.

Martineu, Pierre; and Gregoire, Jean-Francois, to Carnaud Total Interplastic. Method of making hollow articles from plastic material. 4,108,937, Cl. 264-89.000.

Martinez, Antero; and Martinez, Estrella. Wave motor. 4,108,579, Cl. 417-333.000.

Martinez, D. Manuel Torres. Feeding system for manufacturing machines consuming paper supplied in a continuous strip. 4,108,391, Cl. 242-58.300.

Martinez, Estrella: *See—*
Martinez, Antero; and Martinez, Estrella, 4,108,579, Cl. 417-333.000.

Martone, Ronald J.; Goldman, Samuel C.; and Heaton, Clifford C., to Picker Corporation. Scintillation camera with the scintillators in different planes. 4,109,150, Cl. 250-368.000.

Maruzen Petrochemical Co., Ltd.: *See—*
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Maruzen Sewing Machine Co., Ltd.: *See—*
Kohara, Tadao, 4,108,095, Cl. 112-184.000.

Marvin Glass & Associates: *See—*
Baer, Ralph H.; and Fletchic, Donald K., 4,109,114, Cl. 179-100.40D.
Tucker, James E.; Burck, Joseph M.; and Morrison, Howard J., 4,107,872, Cl. 46-103.000.

Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Process for producing ferromagnetic iron oxide. 4,108,787, Cl. 252-62.560.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Kubis, Heribert, 4,108,135, Cl. 123-196.00R.

Maschinenfabrik Hennecke GmbH: *See—*
Proksa, Ferdinand; Raffel, Reiner; and Althausen, Ferdinand, 4,108,585, Cl. 425-89.000.

Masclet, Jean, to S.E.D.I.C. Fishing reel. 4,108,392, Cl. 242-84.21A.

Masi, Lamberto. Aired grip for tennis rackets. 4,108,436, Cl. 273-75.000.

Mason, John Richard; and Foreman, Arthur L., to Dracon Industries. Mounting enclosure for key telephone unit circuit sections. 4,109,294, Cl. 361-399.000.

Mason, William B., to Teccor Electronics, Inc. Power supply. 4,109,306, Cl. 363-61.000.

Massachusetts Institute of Technology: *See—*
Dash, Glen R., 4,109,280, Cl. 358-86.000.
Flemings, Merton C.; Riek, Rodney G.; and Young, Kenneth P., 4,108,643, Cl. 75-135.000.

Massey-Ferguson Inc.: *See—*
Elfes, Lee E.; and Beckerman, Joseph W., 4,107,951, Cl. 64-14.000.
Hern, John F.; and Buccellato, Joseph L., 4,108,483, Cl. 292-272.000.
Mueller, Otto, Jr., 4,108,248, Cl. 172-9.000.

Massey-Ferguson Services N.V.: *See—*
Old, John Leslie, 4,108,463, Cl. 280-460.00A.

Massonne, Joachim; and Becher, Wilfried, to Kali-Chemie Aktiengesellschaft. Process for preparing sulphur hexafluoride. 4,108,967, Cl. 423-469.000.

Mast, John George, Jr., to Procter & Gamble Company, The. Apparatus and method for delivering tampon sacks and inserter parts to an assembly turret. 4,108,299, Cl. 28-119.000.

Mast, William C.; Bauer, Richard G.; and Wathen, Tom M., to Goodyear Tire & Rubber Company, The. Poly(methyl methacrylate) composition. 4,108,923, Cl. 260-836.000.

Mathern, Andre M.: *See—*
Le Noane, Georges E.; Mathern, Andre M.; and Morizur, Gabrielle, 4,108,534, Cl. 350-96.210.

Matsubara, Isao: *See—*
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,109,077, Cl. 536-17.000.

Matsuda, Morio: *See—*
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.

Matsuda, Tamotsu; and Kuroda, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Heater unit for air-conditioner in automobile vehicle. 4,108,376, Cl. 237-12.30A.

Matsumoto, Makoto: *See—*
Hatanaka, Masayuki; Matsumoto, Makoto; and Yonezawa, Masaharu, 4,108,833, Cl. 528-31.000.

Matsumoto, Masayuki: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.

Matsumura, Mutsuo: *See—*
Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, 4,108,893, Cl. 260-561.00N.

Matsushima, Hideo: *See—*
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,109,077, Cl. 536-17.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Oku, Takeshi, 4,109,130, Cl. 219-130.210.
Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, 4,109,143, Cl. 235-462.000.

Matsushita Electronics Corporation: *See—*
Ishikawa, Kiyotsugu; and Itoh, Kunio, 4,108,715, Cl. 156-628.000.
Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, 4,109,175, Cl. 313-112.000.

Mattel, Inc.: *See—*
DeAnda, Nicholas; Dyer, Robert F.; and Newbold, Roger A., 4,108,437, Cl. 273-86.00D.

Matthew, Morton P.; and Rackman, Michael I., to Rackman, Michael I. Action game. 4,108,430, Cl. 273-1.00R.

Matthews, Paul William, to Babcock Kina Limited. Cleaning heads. 4,107,816, Cl. 15-320.000.

Mauer, Dieter: *See—*
Renner, Wolf; and Mauer, Dieter, 4,108,507, Cl. 308-238.000.

Mauro, Peter. Differential hair curler. 4,108,183, Cl. 132-42.00A.

Mawson, Robert James, to Rolls-Royce Limited. Bladed rotor assembly for a gas turbine engine. 4,108,571, Cl. 416-221.000.

Maxsted, Malcolm D.: *See—*
Dixon, Robert L.; and Maxsted, Malcolm D., 4,108,259, Cl. 175-344.000.

Maxwell, George E., Sr. Mattress suspension system. 4,107,797, Cl. 5-118.000.

Mazer, Lloyd M.: *See—*
Egan, William J., Jr.; and Mazer, Lloyd M., 4,108,591, Cl. 431-121.000.

Mazzanobile, Salvatore; and Hillermeier, Robert John, to Beecham Inc. Dental compositions. 4,108,978, Cl. 424-49.000.

McCaffrey, Michael Thomas: *See—*
Castellano, Joseph Anthony; and McCaffrey, Michael Thomas, 4,108,793, Cl. 252-299.000.

McCallum, R. Bruce: *See—*
Black, William M.; and McCallum, R. Bruce, 4,108,275, Cl. 181-252.000.

McCarthy, James R.; and Moore, Jimmie L., to Dow Chemical Company, The. N,15-Didehydro-15-deoxo-pyrimidino-(4,5-b)rifamycin S. 4,108,853, Cl. 544-245.000.

McCartney, Joseph F.; and Gundersen, Charles R., to United States of America, Navy. Submersible battery apparatus. 4,109,062, Cl. 429-6.000.

McCartney, Joseph F.: *See—*
Wrench, Edwin H., Jr.; Hicks, Jay C.; and McCartney, Joseph F., 4,109,117, Cl. 179-175.30F.

McClelland, Robert David: *See—*
Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.

McClendon, Gilbert. Safety warning kit. 4,108,311, Cl. 206-573.000.

McConnell, R. B.: *See—*
Trivedi, Bhupendra C.; Grimm, Robert A.; and McConnell, R. B., 4,109,094, Cl. 548-347.000.

McCoy, Robert H., to Uniroyal, Inc. Carpet backing with rubber latex-solid polyvinyl chloride resin composition. 4,109,039, Cl. 428-95.000.

McDevitt, Robert F. Device for obtaining a sample of liquid. 4,108,003, Cl. 73-425.40R.

McDonnell Douglas Corporation: *See—*
Froyd, Stanley G.; Ue, Raymond C.; and Buchanan, John Paul, 4,109,185, Cl. 318-571.000.
Jones, Roy L., 4,107,986, Cl. 73-147.000.

McFarland, Robert H.: *See—*
Gilliom, John W.; and McFarland, Robert H., 4,108,139, Cl. 126-21.00A.

McGinnis, Edward F., Jr.: *See—*
Tenkman, Robert Henry; Furler, Alan George; and McGinnis, Edward F., Jr., 4,109,223, Cl. 336-84.00C.

McGuire, Murvail C. Sprinkler head locater and marker and method. 4,108,439, Cl. 273-176.00R.

McHenry, Joe M., Jr., to Cutters Machine Company, Inc. Drive disconnect device for a cloth spreading machine. 4,108,293, Cl. 192-67.00R.

McIntosh, Colin Leslie, to Du Pont de Nemours, E. I., and Company. Alkoxycarbonylphosphonic acid derivative brush control agents. 4,108,626, Cl. 71-76.000.

McKee, William H., to TRW Inc. Cover for multi-wire connector. 4,108,526, Cl. 339-103.00M.

McKendry, Lennon H., to Dow Chemical Company, The. Herbicidal use of esters of aminohalopyridyloxy acids. 4,108,629, Cl. 71-94.000.

McKinnon, John J., to Raytheon Company. Microwave tube assembly. 4,109,179, Cl. 315-39.750.

McKnight, Robert J.; Neuwirth, Frank J.; and Gotham, Robert W., to Unex Conveying Systems, Inc. Powered roller accumulation conveyor. 4,108,304, Cl. 198-781.000.

McMillian, Lonnie S.; and Culp, Harold G., to Systems & Technic S.A. Multi-national coin totalizer. 4,109,139, Cl. 235-92.0CN.

McMullen, Carl R.; and Schlageter, Gary M., to Foundry Technology, Inc. Sand cooler control system. 4,108,188, Cl. 134-57.00R.

McNaughton, Lawrence S., to General Electric Company. Circuit for increasing the operating speed range of a velocity servo system. 4,109,190, Cl. 318-609.000.

McNeil Corporation: *See—*
Conery, William J.; and Kiplinger, Terry L., 4,108,386, Cl. 241-46.110.

McNulty, Dennis A., to A. O. Smith Corporation. Position sensing differential transformer system with means to convert the output to an absolute value. 4,109,200, Cl. 324-208.000.

McWhorter, Edward Milton. Bottom cycle manifold for four-stroke internal combustion engines. 4,108,119, Cl. 123-75.00C.

Mears, Whitney Harris, to Allied Chemical Corporation. Purification of saturated hydrocarbons. 4,108,916, Cl. 260-676.00R.

Measurex Corporation: *See—*
Typpo, Pekka Matti; Wennerberg, Gunnar; and Larsen, Tor Grotnes, 4,107,847, Cl. 33-147.00L.

Mechanex Corporation, The: *See—*
Lang, James R., 4,107,999, Cl. 73-326.000.
Lang, James R., 4,108,201, Cl. 137-393.000.

Medovar, Boris Izrailevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Meeker, Greg W.: *See—*
Sloan, James L.; and Meeker, Greg W., 4,107,817, Cl. 16-20.000.

Mefina S.A.: *See—*
Fresard, Marcel, 4,108,092, Cl. 112-158.00R.

Mego Corp.: *See—*
Abrams, D. David, 4,107,869, Cl. 46-21.000.

Mehan, Richard L.; and Morelock, Charles R., to General Electric Company. Coated silicon-based ceramic composites and method for making same. 4,109,050, Cl. 428-332.000.

Meienhofer, Johannes Arnold, to Hoffmann-La Roche Inc. Solid phase synthesis with base N alpha-protecting group cleavage. 4,108,846, Cl. 260-112.50R.

Melcher, Conway H.: *See—*
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,108,080, Cl. 105-199.0CB.

Melton, Keith Nelson; and Sebalj, Renata, to BBC Brown, Boveri & Company Limited. Contact arrangement for an electric arc-electrode consisting of graphite and a method for the manufacture thereof. 4,109,125, Cl. 200-268.000.

Mendrala, James A.; and Peterson, Harold L., to Sonex International Corp. Video traveling matte system. 4,109,278, Cl. 358-22.000.

Mennen, Frederick C., to U.S. Packaging Corp. Paper booklet for presumptive diagnosis of Neisseria Gonorrhoeae in the male. 4,108,729, Cl. 195-127.000.

Merchants National Bank of Allentown, executor: *See—*
Lesh, Nathan George, deceased; Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,109,297, Cl. 361-402.000.

Merck & Co., Inc.: *See—*
Veber, Daniel F.; Brady, Stephen F.; and Varga, Sandor L., 4,108,987, Cl. 424-177.000.

Merkel, Russell D., to Caterpillar Tractor Co. Cutting edge assembly for earthworking devices. 4,108,250, Cl. 172-719.000.

Merkl, George G. Process for the removal of SO_2 from a stack gas, absorptive medium for use in process and process for preparing the absorptive medium. 4,108,969, Cl. 423-560.000.

Merriam, Arthur T., to United States of America, Army. Fan mesh disrupter. 4,108,191, Cl. 135-2.000.

Merrick, James Walter: *See—*
Chapin, Leonard Lee; and Merrick, James Walter, 4,108,127, Cl. 123-124.00R.

Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, to Hitachi, Ltd. Variable thresholding circuit for converting an analog signal to a binary signal. 4,109,211, Cl. 328-116.000.

Messerschmitt-Boelkow-Blohm GmbH: *See—*
Kabilka, Otto; and Schulz, Thilo, 4,108,329, Cl. 220-453.000.

Met-Pro Systems, Inc.: *See—*
Burden, Roy B., Jr., 4,108,088, Cl. 110-246.000.

Metal Box Limited: *See—*
Fidler, Fred; and Holt, Joseph C., 4,108,099, Cl. 113-120.00A.

Metallgesellschaft Aktiengesellschaft: *See—*
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,807, Cl. 521-118.000.
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.

Mey, William, to Eastman Kodak Company. Multi-active photocon-

ductive element with an aggregate and inorganic photoconductor. 4,108,657, Cl. 96-1.600.
Meyer, Paul A.: *See—*
Kopp, Edward L.; Meyer, Paul A.; and Sabol, James N., 4,108,165, Cl. 128-2.00V.
Meyer, Stephen F.; Helle, Amiel R.; and Niese, Leo J., to Reliance Electric Company. Automatic fruit analyzer. 4,109,314, Cl. 364-552.000.
Michael, Harald Richard, to Electrolux GmbH. Method for sewage removal from multi-household connections. 4,108,192, Cl. 137-1.000.
Michel, Robert. Method for manufacture of phosphoric ac^{2}d from phosphate rock. 4,108,957, Cl. 423-3.000.
Michelet, Jacques: *See—*
Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., 4,108,185, Cl. 401-88.000.
Micro Electronics, Inc.: *See—*
Perrino, Joseph A., 4,108,028, Cl. 81-9.50B.
Microdot Inc.: *See—*
Lincoln, Thomas Christopher, 4,108,525, Cl. 339-49.00R.
Miedema, Hotze: *See—*
Donnell, John Robinson; Heiter, George Ludwig; and Miedema, Hotze, 4,109,212, Cl. 328-163.000.
Miessen, Ralf: *See—*
Wolf, Gerhard Dieter; Miessen, Ralf; Kunzel, Hans Egon; and Bentz, Francis, 4,108,936, Cl. 264-78.000.
Mifsud, Joseph F., to Exxon Production Research Company. Hydraulic stabilization system to position and isolate a seismic vibrator. 4,108,270, Cl. 181-114.000.
Mikami, Junji: *See—*
Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, 4,108,893, Cl. 260-561.00N.
Miles Laboratories, Inc.: *See—*
Buckler, Robert Thomas; and Kurchacova, Elva, 4,109,001, Cl. 424-269.000.
Creinin, Howard Lee; and Shemer, Michael, 4,108,847, Cl. 260-112.00G.
Stiso, Sisto Nicholas; and Sutula, Chester L., 4,108,727, Cl. 195-103.50R.
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,108,892, Cl. 260-514.00D.
Mill, Theodore; Gould, Constance W.; Epstein, Joseph; and Schiff, Leon J., to United States of America, Army. Method of oxidative degradation of phosphorous esters. 4,108,746, Cl. 204-158.00R.
Millard, Joe K.; and Cornish, Eldon C., to Hewlett-Packard Company. Third channel oscilloscope display for trigger signal. 4,109,183, Cl. 315-392.000.
Miller, Harold N.: *See—*
Rossi, Albert; and Miller, Harold N., 4,108,612, Cl. 44-62.000.
Miller, James Clayton; Proefrock, Paul R.; and Peppard, James P. K., to Sargent & Greenleaf, Inc. Padlock having knuckle type anti-wedge-attack structure. 4,107,965, Cl. 70-52.000.
Miller, Kenneth H.; and Kropiwnicki, Tadek M., to Carrier Corporation. Suspension system for motor-compressor unit. 4,108,581, Cl. 417-363.000.
Miller, Laird F.; and Fleming, Robert W., to Richardson-Merrell Inc. Anthracene derivatives. 4,108,896, Cl. 260-570.50C.
Miller, Lowell Donald: *See—*
Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.
Miller, Norman Richards, to Bell Telephone Laboratories, Incorporated. Digital feedback control utilizing accumulated reference count to regulate voltage output of switching regulator. 4,109,194, Cl. 323-17.000.
Miller, Robert Eric; and Jackson, Stanley Bishop, to Universal Fluid Heads (Aust.) Pty. Limited. Clamp for tripod device. 4,108,412, Cl. 248-181.000.
Milliken Research Corporation: *See—*
Froehlich, Helmut H., 4,108,800, Cl. 252-541.000.
Gregory, Wallace D.; and Moore, James R., 4,108,708, Cl. 156-441.000.
Minami, Hidehiro; Ikeura, Kenji; and Shioyama, Giichi, to Nissan Motor Company, Limited. Method of and apparatus for controlling air/fuel ratio in internal combustion engine. 4,107,920, Cl. 60-276.000.
Minami, Hidehiro; and Waku, Makio. Closed loop mixture control system using a two-barrel carburetor. 4,108,121, Cl. 123-119.0EC.
Minck, Robert W., to Ford Motor Company. Method and apparatus for separating a metal from a salt thereof. 4,108,743, Cl. 204-64.00R.
Minden, Henry Thomas; and Premo, Richard W., to Sperry Rand Corporation. High efficiency fuser roll assembly for xerographic material. 4,109,135, Cl. 219-216.000.
Minemura, Norihiro: *See—*
Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.
Minichiello, Thomas. Spring type exercise device for breast measurement development. 4,108,429, Cl. 272-136.000.
Mining Equipment Division, FMC Corporation: *See—*
Woodford, Clarence H., II, 4,108,253, Cl. 173-23.000.
Minix, Helen, administratrix: *See—*
Minix, James Warren, deceased; Minix, Richard W., administrator; and Minix, Helen, administratrix, 4,108,346, Cl. 228-49.000.
Minix, James Warren, deceased; by Minix, Richard W., administrator; and by Minix, Helen, administratrix. Alignment clamp. 4,108,346, Cl. 228-49.000.
Minix, Richard W., administrator: *See—*
Minix, James Warren, deceased; Minix, Richard W., administrator; and Minix, Helen, administratrix, 4,108,346, Cl. 228-49.000.
Minnesota Mining and Manufacturing Company: *See—*
Anderson, Raymond H.; and Vanderwerf, Dennis F., 4,108,540, Cl. 350-211.000.
Gutman, Gustav; and Goettert, Edward, 4,108,665, Cl. 96-114.100.
Patterson, Richard A., 4,108,330, Cl. 220-260.000.
Minogue, Robert Willis, to Federal Signal Corporation. Sign mounting fastener. 4,108,560, Cl. 403-33.000.
Minoura, Kazuo, to Canon Kabushiki Kaisha. Light beam scanning device. 4,108,532, Cl. 350-6.600.
Minowa, Seigi; Toyoshima, Yasuo; Yasuda, Nozomi; and Tanaka, Toshiro, to Asahi Denka Kogyo K.K. Hard butter. 4,108,879, Cl. 260-405.600.
Mita Industrial Company Ltd.: *See—*
Takayama, Hiroshi; and Aizawa, Tatsuo, 4,108,786, Cl. 252-62.10P.
Mitani, Toshihiko, to Nippon Electric Company, Ltd. Correlative converter between a 2^{n}-ary code sequence and a 2^{n+1}-phase carrier pulse sequence. 4,109,101, Cl. 178-67.000.
Mitchell, Alec; Goldsmith, James R.; and Gray, J. Malcolm, to Molycorp, Inc. Preparation of rare earth and other metal alloys containing aluminum and silicon. 4,108,645, Cl. 75-135.000.
Mitchell, Robert Dennis. Zirconium layer for bonding diamond compact to cemented carbide backing. 4,108,614, Cl. 51-295.000.
Mitsubishi Chemical Industries Limited: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Satoh, Tsuyoshi; and Tachino, Kenzo, 4,108,282, Cl. 187-29.00R.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hayase, Masao; and Araki, Kazunori, 4,108,300, Cl. 198-479.000.
Kubo, Masayoshi; and Katayama, Hideaki, 4,108,776, Cl. 210-224.000.
Tatani, Atsushi; Omoto, Setsuo; and Shiraishi, Yoshihiro, 4,108,959, Cl. 423-240.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Kamada, Kazumasa; Handa, Ryoji; Kusakawa, Norihisa; and Yamamoto, Keita, 4,108,946, Cl. 260-881.000.
Mitsui Aluminum Co., Ltd.: *See—*
Tsumura, Yoshishige, 4,108,741, Cl. 204-67.000.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Eiraku, Kunihiro, 4,108,541, Cl. 350-289.000.
Mitsui, Murao; Yokogawa, Kiyoshi; and Fukuyama, Seiji, to Agency of Industrial Science & Technology. Vessel for atmosphere for use with material testing device. 4,107,982, Cl. 73-95.000.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, 4,108,893, Cl. 260-561.00N.
Mitsuyama, Akira; Uchiyama, Hiroaki; and Deguchi, Masanobu, to Sharp Kabushiki Kaisha. Driving mechanism for travelling original carrier in an electrophotographic copying machine. 4,108,544, Cl. 355-8.000.
Miura, Norio: *See—*
Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.
Miya, Bunji: *See—*
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.
Miyamoto, Koichi: *See—*
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,108,427, Cl. 271-9.000.
Miyatake, Takafumi: *See—*
Mese, Michihiro; Ejiri, Masakazu; Kashioka, Seiji; Miyatake, Takafumi; and Hamada, Toshimitsu, 4,109,211, Cl. 328-116.000.
Mlynek, Daniel: *See—*
Gerlach, Albrecht; Holzmann, Dieter; Mlynek, Daniel; and Hoffmeister, Dirk, 4,109,210, Cl. 328-61.000.
Mobil Oil Corporation: *See—*
Brown, George L.; and Chen, Albert C., 4,108,816, Cl. 260-29.40R.
Chen, Nai Yuen; and Yan, Tsoung-Yuan, 4,108,730, Cl. 201-2.500.
Rollmann, Louis Deane; and Valyocsik, Ernest William, 4,108,881, Cl. 260-448.00C.
Schoennagel, Hans-Juergen; and Zahner, John C., 4,108,758, Cl. 208-8.000.
Modular Conceptual Systems, Inc.: *See—*
Carter, William Edward; and Cosentino, Italo Americo (said William E. Carter assors. to), 4,107,795, Cl. 4-313.000.
Moehrle, Doris B. Reusable tampon. 4,108,180, Cl. 128-285.000.
Mohler, Johann Georg. Fire sprinkler head. 4,108,247, Cl. 169-38.000.
Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, to Hoechst Aktiengesellschaft. Hydroxyhexyl-alkylxanthines and pharmaceutical compositions containing hydroxyhexyl-alkylxanthines. 4,108,995, Cl. 424-253.000.
Moilliet, John Stewart, to Imperial Chemical Industries Limited. Anaesthetic composition. 4,109,016, Cl. 424-342.000.
Molaug, Ole, to Tralfa Nils Underhaug A/S. Flexible robot arm. 4,107,948, Cl. 64-2.00P.
Molaug, Ole: *See—*
Inoue, Kiyoshi; and Molaug, Ole, 4,108,357, Cl. 235-119.000.
Moller, Richard W., to Hydreclaim Corporation. Apparatus for feeding scrap and base plastics material to an extruder. 4,108,334, Cl. 222-136.000.

Moller, William Michael: *See*—
Bindell, Jeffrey Bruce; Labuda, Edward Franklin; and Moller, William Michael, 4,107,835, Cl. 29-590.000.
Molleron, Claude Auguste, to Societe Anonyme de Telecommunications. Method and apparatus for detecting the presence of signal components of predetermined frequency in multifrequency PCM signal. 4,109,109, Cl. 179-15.0BY.
Molycorp, Inc.: *See*—
Mitchell, Alec; Goldsmith, James R.; and Gray, J. Malcolm, 4,108,645, Cl. 75-135.000.
Monarch Marking Systems, Inc.: *See*—
Dobras, Bruce W., 4,108,368, Cl. 235-463.000.
Moneghan, Edward, to Pennwalt Corporation. Method for forming solid friction material structures. 4,108,935, Cl. 264-68.000.
Monitron Industries, Inc.: *See*—
Genest, Leonard J.; and Feagin, Frederick E., 4,108,366, Cl. 235-450.000.
Monroe Auto Equipment Company: *See*—
vanden Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 4,107,814, Cl. 15-250.420.
Monsanto Company: *See*—
Birum, Gail H., 4,108,949, Cl. 260-932.000.
Bollinger, Frederic G.; and D'Amico, John J., 4,108,627, Cl. 71-91.000.
Bollinger, Frederic G.; D'Amico, John J.; and Hansen, Dale J., 4,108,632, Cl. 71-115.000.
Christ, Thomas; and Langguth, Robert P., 4,108,801, Cl. 252-544.000.
Deets, Gary L., 4,109,067, Cl. 526-4.000.
Lee, Cheng H., 4,108,765, Cl. 210-23.00R.
Lee, Yoon C., 4,108,943, Cl. 260-878.00R.
Shuff, Thomas J.; and Sims, Robert W., 4,107,993, Cl. 73-290.00R.
Montedison S.p.A.: *See*—
Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.
Monthony, James F.: *See*—
Wegfahrt, Paul F.; Lewin, Nathan; and Monthony, James F., 4,108,974, Cl. 424-1.000.
Moody, Harry John: *See*—
Kudsia, Chandra Mohan; Moody, Harry John; and Keyes, Lorne Allan, 4,109,202, Cl. 325-3.000.
Moog, Robert A.; and Cox, Roger Flavius, to Norlin Music, Inc. Phase shifting sound effects circuit. 4,108,041, Cl. 84-1.240.
Mookherjee, Braja Dulal: *See*—
Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.
Moore Business Forms, Inc.: *See*—
Fredrickson, Donald M., 4,109,047, Cl. 428-307.000.
Moore, Charles E.: *See*—
Gort, Alfred Frans; and Moore, Charles E., 4,108,539, Cl. 350-201.000.
Moore, George B., Jr. Carbon dioxide absorption canister for use with analgesia equipment. 4,108,172, Cl. 128-188.000.
Moore, James R.: *See*—
Gregory, Wallace D.; and Moore, James R., 4,108,708, Cl. 156-441.000.
Moore, Jimmie L.: *See*—
McCarthy, James R.; and Moore, Jimmie L., 4,108,853, Cl. 544-245.000.
Moore, Richard G., III, to Continental Oil Company. Sliding stabilizer assembly. 4,108,256, Cl. 175-61.000.
Moore, Robert J., to Weed Eater, Inc. Lawn mower with mechanical line feed. 4,107,901, Cl. 56-17.500.
Moore, William Percy. Process for improved ruminant feed supplements. 4,109,019, Cl. 426-69.000.
Moorey, Ernest James, to M. L. Engineering (Plymouth) Limited. Frequency modulation signalling system employing an electrical filter device. 4,109,205, Cl. 325-45.000.
Morabito, Joseph Michael: *See*—
Lesh, Nathan George, deceased; Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,109,297, Cl. 361-402.000.
Morane, Bruno P.: *See*—
Boulogne, Jean P.; Hochmann, Thibaud; Michelet, Jacques; and Morane, Bruno P., 4,108,185, Cl. 401-88.000.
Moraw, Roland, to Hoechst Aktiengesellschaft. Apparatus for lifting an electrostatically charged flexible recording material. 4,108,550, Cl. 355-133.000.
Morelock, Charles R.: *See*—
Mehan, Richard L.; and Morelock, Charles R., 4,109,050, Cl. 428-332.000.
Morganroth, Shila. Clamp devices for use in selectively altering hair color. 4,108,184, Cl. 132-46.00R.
Mori, Etsuo: *See*—
Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.
Morishita, Toshio: *See*—
Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.
Moriya, Koji; and Furuoya, Itsuo, to Takeda Chemical Industries, Ltd. Production of maleic anhydride. 4,108,874, Cl. 260-346.750.
Morizur, Gabrielle: *See*—
Le Noane, Georges E.; Mathern, Andre M.; and Morizur, Gabrielle, 4,108,534, Cl. 350-96.210.
Morlock, Gerhard: *See*—
Amann, Herbert; and Morlock, Gerhard, 4,108,838, Cl. 528-249.000.
Morokawa, Shigeru: *See*—
Sekiya, Fukuo; Morokawa, Shigeru; and Nomura, Yasushi, 4,107,915, Cl. 58-23.00R.
Morrell, Albert Maxwell: *See*—
Godfrey, Richard Hugh; and Morrell, Albert Maxwell, 4,109,177, Cl. 313-402.000.
Morris, Charles F. Cylinder ridge grinder. 4,107,884, Cl. 51-245.000.
Morris, Earl F.: *See*—
Crinkelmeyer, Oliver W.; and Morris, Earl F., 4,108,930, Cl. 264-32.000.
Morris, Earl L., to Acorn Engineering Co. Waste drain connection for plumbing fixtures. 4,108,477, Cl. 285-58.000.
Morrison, Howard J.: *See*—
Tucker, James E.; Burck, Joseph M.; and Morrison, Howard J., 4,107,872, Cl. 46-103.000.
Morton, Douglas Ross, Jr., to Upjohn Company, The. PGD_2 analogs. 4,108,878, Cl. 260-408.000.
Morton-Norwich Products, Inc.: *See*—
Wright, George C.; and Goldenberg, Marvin M., 4,108,862, Cl. 260-307.00C.
Wright, George C.; and Goldenberg, Marvin M., 4,108,872, Cl. 260-345.200.
Wright, George C.; and Goldenberg, Marvin M., 4,108,873, Cl. 260-345.200.
Moskalenko, Galina Evseevna: *See*—
Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.
Moskowitz, David, to Ford Motor Company. Cemented titanium carbide tool for intermittent cutting application. 4,108,649, Cl. 75-203.000.
Motoki, Goro: *See*—
Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,109,079, Cl. 536-26.000.
Motorola, Inc.: *See*—
Davis, William F., 4,109,234, Cl. 340-52.00B.
Main, W. Eric, 4,109,214, Cl. 330-254.000.
Mountain, Donald C. Hermetically sealed four-way valve. 4,108,206, Cl. 137-596.170.
Mowli, John C.: *See*—
Bala, Harry; and Mowli, John C., 4,108,712, Cl. 156-498.000.
Mueller, Bernd: *See*—
Vachenauer, Erwin; and Mueller, Bernd, 4,109,250, Cl. 343-112.00R.
Mueller, Klaus Karl; and Loughlin, James Osborn E., to Cotton Incorporated. Process for imparting pucker and color effects to fabrics. 4,108,597, Cl. 8-115.000.
Mueller, Otto, Jr., to Massey-Ferguson Inc. Draft and position control linkage with depth limit for a tractor. 4,108,248, Cl. 172-9.000.
Mueller, Ruediger: *See*—
Herbst, Heiner; and Mueller, Ruediger, 4,109,272, Cl. 357-35.000.
Muench, Elmer W.: *See*—
Long, Everett James; and Muench, Elmer W., 4,108,528, Cl. 339-117.00P.
Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., to Indiana University Foundation. Dentifrice preparations comprising aluminum and a compatible abrasive. 4,108,979, Cl. 424-49.000.
Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., to Indiana University Foundation. Alkaline oral compositions comprising aluminum and a carboxylic acid. 4,108,981, Cl. 424-55.000.
Muhlhofer, Ernst: *See*—
Kratel, Gunter; Muhlhofer, Ernst; and Schreiner, Franz, 4,108,964, Cl. 423-336.000.
Mukai, Kosabro: *See*—
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Mulberry Metal Products, Inc.: *See*—
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Mullins, Wayne L. Interlocking cementitious building blocks. 4,107,894, Cl. 52-593.000.
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Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, to Yamanouchi Pharmaceutical Co., Ltd. 2-(Indenyloxymethyl) morpholine derivatives. 4,109,088, Cl. 544-174.000.
Murakami, Osamu, to Kett Electric Laboratory. Self-propelled pipe inspecting apparatus. 4,108,004, Cl. 73-432.00R.
Muranishi, Kenichi, to Ricoh Watch Co., Ltd. Device of preventing reverse transmission of motion in a gear train. 4,108,016, Cl. 74-462.000.
Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, to Fujitsu Limited. Driving system and method for shifting a discharge spot in a plasma display panel. 4,109,181, Cl. 315-169.0TV.

Murata Kikai Kabushiki Kaisha: *See*—
Yamana, Makoto; and Kubota, Nobunori, 4,107,911, Cl. 57-56.000.
Murayama, Masao: *See*—
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Murillo, Carlos P.: *See*—
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Murray, Gregory J.: *See*—
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Murrmann, Helmuth: *See*—
Glasl, Andreas; and Murrmann, Helmuth, 4,109,273, Cl. 357-35.000.
Musgrave, Daniel Dennis. Magazine engagement means. 4,107,863, Cl. 42-50.000.
Musgrave, Daniel Dennis. Explosive obstacle wire. 4,108,070, Cl. 102-8.000.
N. Schlumberger & Cie: *See*—
Herubel, Jean Frederic, 4,107,821, Cl. 19-127.000.
Nabeshima, Shigeyasu: *See*—
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,108,723, Cl. 195-2.000.
Nabucet, Georges Joseph; and Champ, Michel Andre. Cutting device having a shaped charge in a cavity of revolution. 4,108,071, Cl. 102-24.0HC.
Nafziger, Joel L. Flush tank system. 4,107,796, Cl. 4-353.000.
Nagase, Toshiro; and Hatakeyama, Susumu, to Tokico Ltd. Device for adjusting length of gas spring. 4,108,416, Cl. 248-400.000.
Nagase, Tsuneyuki: *See*—
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Nagata, Kenji: *See*—
Takemura, Toshisade; Sugi, Shohzaburo; Nagata, Kenji; and Yahagi, Ryohhei, 4,108,912, Cl. 260-667.000.
Nakabe, Sanai, to Sumitomo Metal Mining Company Limited. Process for separating nickel, cobalt and copper. 4,108,638, Cl. 75-63.000.
Nakada, Masahiko: *See*—
Sanada, Masakatsu; and Nakada, Masahiko, 4,108,126, Cl. 123-122.00E.
Nakagawa, Yasuhiko; and Mukai, Kosabro, to Nissan Motor Company, Ltd. Manifold system. 4,108,124, Cl. 123-122.0AC.
Nakama, Fumio: *See*—
Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, 4,108,288, Cl. 191-49.000.
Nakamura, Masayuki: *See*—
Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, 4,108,777, Cl. 210-225.000.
Nakamura, Nobutaka; Saeki, Yukio; and Nemoto, Shigeru, to Sumitomo Durez Company, Ltd. Method for accelerated curing of phenolic resin adhesives. 4,109,057, Cl. 428-528.000.
Nakamura, Norihiko: *See*—
Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, 4,108,133, Cl. 123-191.00S.
Nakamura, Teruya: *See*—
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Nakaniwa, Mikio: *See*—
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.
Nakano, Yuji: *See*—
Shibayama, Masayoshi; Nakano, Yuji; and Shimizu, Youji, 4,109,292, Cl. 361-321.000.
Nakao, Kiyoharu, to Kabushiki Kaisha Komatsu Seisakusho. No-man control system for working vehicles. 4,108,269, Cl. 180-98.000.
Nakasa, Hiroyasu: *See*—
Kanagawa, Tadashi; and Nakasa, Hiroyasu, 4,107,981, Cl. 73-88.00E.
Nakatsuka, Shinichi: *See*—
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Nalivaiko, Valentin Iosifovich: *See*—
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Nara, Kiyoshi; Sumino, Yasuhiro; Asai, Mitsuko; and Akiyama, Shunichi, to Takeda Chemical Industries, Ltd. Method for preparing antibiotic P-2563 using *Pseudomonas fluorescens*. 4,108,724, Cl. 195-96.000.
Nara, Takashi: *See*—
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,109,077, Cl. 536-17.000.
Narayan, Thirumurti; and Cenker, Moses, to BASF Wyandotte Corporation. Novel oxyalkylated polyol prepolymers, flame retardant interpolymers prepared therefrom, and processes for the preparation thereof. 4,108,808, Cl. 521-181.000.
Narayan, Thirumurti; and Cenker, Moses, to BASF Wyandotte Corporation. Novel prepolymers, flame retardant interpolymers prepared therefrom, and processes for the preparation thereof. 4,108,809, Cl. 521-136.000.
Narey, Edward F.: *See*—
England, Alfred W.; Krasny, Louis M.; and Narey, Edward F., 4,109,310, Cl. 364-200.000.
Nash, Bernard J., Jr. Portable tack cleaning machine. 4,107,807, Cl. 15-21.00C.
Nash, Richard B.: *See*—
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National Controls, Inc.: *See*—
Sommer, Thomas R., 4,107,985, Cl. 73-141.00A.
National Distillers and Chemical Corporation: *See*—
Pritchett, Ervin G., 4,108,948, Cl. 260-897.00B.
National Research Development Corporation: *See*—
Coxon, Brian; and Leventhall, Hubert Geoffrey, 4,109,108, Cl. 179-1.00P.
Parker, Robert Sydney Richard, 4,108,169, Cl. 128-89.00R.
Robertson, Penrose David; and Coulouris, George Franklin, 4,109,282, Cl. 358-127.000.
National Semiconductor Corporation: *See*—
Hatch, John Alva, 4,109,269, Cl. 357-19.000.
Naus, Glen L. Locomotive cab seat. 4,108,493, Cl. 297-337.000.
NCR Corporation: *See*—
Berenson, Sidney G., 4,109,288, Cl. 361-58.000.
Rostek, Paul M.; and Baeyertz, John F., 4,109,295, Cl. 361-401.000.
Rostek, Paul M.; and Baeyertz, John F., 4,109,296, Cl. 361-401.000.
NDM Corporation: *See*—
Tenkman, Robert Henry; Furler, Alan George; and McGinnis, Edward F., Jr., 4,109,223, Cl. 336-84.00C.
Neiman, Michel, to Societe de Diffusion Neiman. Anti-theft plug for screw-threaded base with a tightening torque limiting device. 4,107,960, Cl. 248-165.000.
Nelson, David H., to Van Dyke, Homer; Dorian, Mark; Van Dyke, Dave; and Lerg, George, part interest to each. Solar energy collection system. 4,108,154, Cl. 126-270.000.
Nelson Industries, Inc.: *See*—
Hall, Leonard F.; and Noreen, Robert A., 4,108,276, Cl. 181-256.000.
Nelson, Marie C.: *See*—
Portnoy, Norman A.; Arthur, Jett C., Jr.; Margavio, Matthew F.; and Nelson, Marie C., 4,108,748, Cl. 204-159.120.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-ω-phenoxy-PGA_1 or 9-deoxy-9,10-didehydro-PGD_1 compounds. 4,108,900, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. Composition and process 2-decarboxy-2-hydroxy-methyl-5-oxa-ω-phenyl-PGE_1compounds. 4,108,901, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-5-oxa-ω-phenyl-PGA_1 or 9-deoxy-9,10-didehydro-PGD_1 compounds. 4,108,902, Cl. 260-590.00C.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-3,7-inter-m-phenylene-ω-phenyl-PGD_1 compounds. 4,108,903, Cl. 260-590.00C.
Nemoto, Shigeru: *See*—
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Netsvetaev, Gennady Viktorovich: *See*—
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Neubeck, Kurt; Schwing, Karl-Heinz; and Klein, Kurt, to Alexander Wiegand GmbH u. Co., Armaturen- u. Manometeneabrik. Manometers with measurement range multiplication. 4,108,007, Cl. 73-732.000.
Neuwirth, Frank J.: *See*—
McKnight, Robert J.; Neuwirth, Frank J.; and Gotham, Robert W., 4,108,304, Cl. 198-781.000.
Neuzil, Richard W.: *See*—
Rosback, Donald H.; and Neuzil, Richard W., 4,108,915, Cl. 260-674.0SA.
Newbold, Roger A.: *See*—
DeAnda, Nicholas; Dyer, Robert F.; and Newbold, Roger A., 4,108,437, Cl. 273-86.00D.
Newland, Robert Andrew; and Leeke, Wallace Richard. Anchoring device. 4,107,806, Cl. 9-310.00E.
Newton, Wayne McCall: *See*—
Dembiak, Matthew Raymond; and Newton, Wayne McCall, 4,109,099, Cl. 174-107.000.
Nicolas, Louis: *See*—
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Niedballa, Ulrich: *See*—
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Niemaszyk, Casimer; and Rothenberg, Peter, to Bendix Corporation, The. Portable circuit tester. 4,108,358, Cl. 235-302.000.
Niese, Leo J.: *See*—
Meyer, Stephen F.; Helle, Amiel R.; and Niese, Leo J., 4,109,314, Cl. 364-552.000.
Niigata, Kunihiro: *See*—
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa;

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Niiya, Toshio: *See*—
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Nikki-Universal Co., Ltd.: *See*—
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,108,971, Cl. 423-428.000.

Ninomiya, Michikazu: *See*—
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Nippon Ceon Co., Ltd.: *See*—
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Nippon Coinco Co., Ltd.: *See*—
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Nippon Electric Company, Ltd.: *See*—
Iijima, Hiroshi, 4,109,161, Cl. 307-87.000.
Mitani, Toshihiko, 4,109,101, Cl. 178-67.000.
Yoshida, Yasuharu; and Tagashira, Yoshimi, 4,109,102, Cl. 178-69.100.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Aoki, Eiichiro, 4,108,038, Cl. 84-1.030.
Chibana, Masanobu; Futamase, Tsuyoshi; and Yamada, Hideo, 4,108,040, Cl. 84-1.190.
Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, 4,109,208, Cl. 328-13.000.

Nippon Hoso Kyokai: *See*—
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Nippon Kokan Kabushiki Kaisha: *See*—
Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, 4,108,675, Cl. 106-56.000.

Nippon Oil Company Ltd.: *See*—
Takeda, Hiroo; Kanda, Takeshi; Oguchi, Yutaka; and Asano, Naomasa, 4,108,682, Cl. 134-25.00R.

Nippon Shinyaku Co., Ltd.: *See*—
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Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See*—
Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.

Nippon Steel Corporation: *See*—
Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, 4,108,694, Cl. 148-31.550.

Nippon Tungsten Co., Ltd.: *See*—
Ogawa, Kazuki; Koizumi, Mitsue; Furukawa, Mitsuhiko; Hara, Yoshimichi; and Kitahira, Takashi, 4,108,652, Cl. 75-223.000.

Nishina, Shuho: *See*—
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Nishioka, Tatsujiro: *See*—
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Nissan Motor Company, Limited: *See*—
Hayashi, Yoshimasa, 4,108,132, Cl. 123-188.00S.
Iizuka, Haruhiko, 4,107,921, Cl. 60-288.000.
Kosaka, Katuaki; and Ueno, Zene, 4,108,114, Cl. 123-3.000.
Minami, Hidehiro; Ikeura, Kenji; and Shioyama, Giichi, 4,107,920, Cl. 60-276.000.
Nakagawa, Yasuhiko; and Mukai, Kosabro, 4,108,124, Cl. 123-122.0AC.

Nisshin Steel Company, Limited: *See*—
Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.

Niwa, Takao; Yoshioka, Mamoru; and Tate, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Accelerator pump system. 4,108,951, Cl. 261-34.00B.

Noda, Shigeo: *See*—
Shima, Yoshio; Noda, Shigeo; and Owa, Kaoru, 4,109,188, Cl. 318-602.000.

Nogaj, Alfred: *See*—
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Nohara, Shigezo, to Toyo Seikan Kaisha, Ltd. Laminated packing materials. 4,109,037, Cl. 428-35.000.

Nomura, Yasushi: *See*—
Sekiya, Fukuo; Morokawa, Shigeru; and Nomura, Yasushi, 4,107,915, Cl. 58-23.00R.

Noreen, Robert A.: *See*—
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Norlin Music, Inc.: *See*—
Moog, Robert A.; and Cox, Roger Flavius, 4,108,041, Cl. 84-1.240.

Norman Slater, Inc.: *See*—
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Norris Industries: *See*—
Dietrich, Hagen; Fane, William J.; and Potschka, Joseph, 4,108,482, Cl. 292-165.000.

Norris, Orlin R., to JeNor. Gauge glass protector. 4,108,000, Cl. 73-328.000.

North American Philips Corporation: *See*—
Vink, Richard C., 4,108,053, Cl. 99-306.000.

Northern Telecom Limited: *See*—
Hillman, Garth Decker, 4,109,146, Cl. 250-227.000.

Nozaki, Yoshihisa: *See*—
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

Numata, Tatsuo, to Pioneer Electronic Corporation. Signal strength meter drive circuit. 4,109,206, Cl. 325-319.000.

NUTRO Patentverwertungs- und Maschinenhandels GmbH: *See*—
Grocke, Diethelm W. K.; and Jager, Wilfried, 4,107,905, Cl. 53-3.000.

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Rathje, Uwe; and Schumacher, Hans Jurgen, 4,108,251, Cl. 172-789.000.

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Peters, Martinus T. J., 4,108,653, Cl. 96-1.0SD.
Van Herten, Jozef Marie, 4,109,134, Cl. 219-216.000.

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Yamaguchi, Tetsuo; Hane, Toshihide; Ochiai, Hidehiro; and Harada, Shuzi, 4,109,143, Cl. 235-462.000.

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John, Erich; Oesterle, Albert; and Pollak-Banda, Erich, 4,108,018, Cl. 74-467.000.

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Seko, Maomi; Ogawa, Shinsaku; and Yoshida, Muneo, 4,108,742, Cl. 204-98.000.

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Ohkubo, Kazuo: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.

Ohling, Robert S., to Acoolco Corporation. Freezing apparatus and method. 4,107,943, Cl. 62-320.000.

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Ohnishi, Masahiro, to Fuji Photo Film Co., Ltd. Laser computer output microfilmer. 4,109,256, Cl. 354-4.000.

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Ohnuma, Kiyoshi: *See*—
Arai, Hajime; and Ohnuma, Kiyoshi, 4,108,022, Cl. 74-645.000.
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Ohta, Masafumi; Hashimoto, Mitsuru; and Kozima, Akio, to Ricoh Co., Ltd. Photoconductive member having a charge generating pigment and 2,4,7-trinitrothioxanthone as charge transport material. 4,108,656, Cl. 96-1.50R.
Ohta, Tadao, to Isuzu Motors Limited. Combustion chamber and nozzle arrangement for direct fuel injection type diesel engine. 4,108,116, Cl. 123-32.00A.
Ohuchi, Teruo: *See*—
Chikashige, Kiyoshi; and Ohuchi, Teruo, 4,108,162, Cl. 128-2.00B.
Oishi, Susumu; and Iwatsuki, Masahiro, to Tokai-Rika-Denki-Seisaku-sho. Seatbelt retractor for motor vehicles. 4,108,394, Cl. 242-107.40A.
Okabe, Hiroshi; Hase, Noboru; Asai, Hitoshi; and Hiramatu, Teruo, to Sumitomo Metal Industries, Ltd. Hot strip coiling mandrel. 4,107,969, Cl. 72-148.000.
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Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Shosuke Okamoto. N^2-Arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,108,986, Cl. 424-177.000.
Okamoto, Takio: *See*—
Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, 4,109,175, Cl. 313-112.000.
Okazaki, Masaki: *See*—
Tanaka, Mitsugu; Okazaki, Masaki; Aono, Toshiaki; and Hirose, Takeshi, 4,108,663, Cl. 96-74.000.
Oku, Takeshi, to Matsushita Electric Industrial Co., Ltd. Electric welder output control device. 4,109,130, Cl. 219-130.210.
Okumura, Takatoshi: *See*—
Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, 4,109,208, Cl. 328-13.000.
Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, to Canon Kabushiki Kaisha. Reflex camera with a built-in exposure metering apparatus. 4,109,257, Cl. 354-23.00R.
Okutsu, Eiichi: *See*—
Hayashi, Katsumi; Iijima, Yoo; and Okutsu, Eiichi, 4,108,662, Cl. 96-66.500.
Old, John Leslie, to Massey-Ferguson Services N.V. Implement support linkages. 4,108,463, Cl. 280-460.00A.
Olffers, Theo: *See*—
Krieg, Martin; and Olffers, Theo, 4,108,769, Cl. 210-50.000.
Olin Corporation: *See*—
Farmer, Douglas A., Jr.; and Wojtowicz, John A., 4,108,792, Cl. 252-187.00H.
Martin, R. Hugo; and Owens, William F., Jr., 4,108,151, Cl. 131-9.000.
Olschewski, Armin: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,503, Cl. 308-6.00C.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,504, Cl. 308-6.00C.
Olshausen, Kai D., to Institutt for Atomenergi. Method and apparatus for gauging the radial spacing between fuel and surrounding cladding of a fuel rod for nuclear reactors. 4,108,719, Cl. 176-19.00R.
Olsson, Mats Gunnar; Tollerz, Carl Ove; and Wretemark, Sven Gunnar, to Telefonaktiebolaget L M Ericsson. High voltage cable. 4,109,098, Cl. 174-106.0SC.
Olympus Optical Company Ltd.: *See*—
Hashimoto, Akihiko, 4,109,265, Cl. 354-244.000.
Yonekubo, Ken, 4,108,794, Cl. 252-408.000.
Omoto, Setsuo: *See*—
Tatani, Atsushi; Omoto, Setsuo; and Shiraishi, Yoshihiro, 4,108,959, Cl. 423-240.000.
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Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.
Onder, Kemal B.: *See*—
Chen, Augustin T.; and Onder, Kemal B., 4,108,843, Cl. 528-74.000.
Ondetti, Miguel Angel, to E. R. Squibb & Sons, Inc. Thiopropanoylamino acid derivatives. 4,108,886, Cl. 260-455.00R.
Onillon, Michel; Roche, Pierre; and Thenard, Jean, to Commissariat a l'Energie Atomique. Method and an automatic device for analyzing variations in the transparency of a sample. 4,109,159, Cl. 250-564.000.
Onopchenko, Anatoli: *See*—
Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, 4,108,788, Cl. 252-63.000.
Ontario Limited: *See*—
Fleet, Bernard; and Das Gupta, Sankar, 4,108,754, Cl. 204-263.000.
Fleet, Bernard; and Das Gupta, Sankar, 4,108,755, Cl. 204-263.000.
op de Laak, Johannes H. A.: *See*—
Koeleman, Gerardus A. J.; and op de Laak, Johannes H. A., 4,108,658, Cl. 96-15.00D.
Orkin, Stanley S., to Kamatics Corporation. Bearing assembly. 4,108,505, Cl. 308-72.000.
Orlanski, Isidoro. Sleeper adapter for a collapsible baby stroller. 4,108,468, Cl. 280-648.000.
Orlowski, Jan Alexander: *See*—
Lee, Henry L., Jr.; and Orlowski, Jan Alexander, 4,107,845, Cl. 32-15.000.
Oronzio de Nora Impianti Electtrochimici S.p.A.: *See*—
de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., 4,108,756, Cl. 204-286.000.
Orton, Dale W. Catheter insertion apparatus. 4,108,175, Cl. 128-214.400.
Osborn, Norbert, to WRR Industries, Inc. Bearing lubricating system. 4,108,506, Cl. 308-187.000.
Osgood, John H., to Crompton & Knowles Corporation. Control mechanism for gripper shuttles. 4,108,215, Cl. 139-438.000.
Ostby, Lyle D.: *See*—
Johnstone, Richard; and Ostby, Lyle D., 4,109,309, Cl. 364-120.000.
Otis Engineering Corporation: *See*—
Sizer, Phillip S., 4,108,257, Cl. 175-230.000.
Otrhalek, Joseph V.; and Gomes, Gilbert Stephen, to IMC Chemical Group, Inc. Snow and ice control composition. 4,108,669, Cl. 106-13.000.
Ottaviano, Gary W., to Ranpak Corporation. Cushioning dunnage product produced from cushioning dunnage mechanism. 4,109,040, Cl. 428-129.000.
Owa, Kaoru: *See*—
Shima, Yoshio; Noda, Shigeo; and Owa, Kaoru, 4,109,188, Cl. 318-602.000.
Owen, Edwin Lewis; and Marshall, David William, to Kennecott Copper Corporation. Fabrication of cathodes for electrodeposition. 4,109,028, Cl. 427-58.000.
Owen-Illinois, Inc.: *See*—
Ernsthausen, Roger E.; Fein, Michael E.; and Byrum, Bernard W., Jr., 4,109,176, Cl. 313-220.000.
Owens, Charles. Pull out-step. 4,108,458, Cl. 280-166.000.
Owens-Illinois, Inc.: *See*—
Amberg, Stephen W., 4,108,347, Cl. 229-1.50B.
Hadl, Clyde F.; and Harmon, Shepard L., 4,108,705, Cl. 156-355.000.
Kontz, Robert F., 4,108,590, Cl. 425-466.000.
Lee, Soo-Il, 4,108,956, Cl. 264-329.000.
Owens, William F., Jr.: *See*—
Martin, R. Hugo; and Owens, William F., Jr., 4,108,151, Cl. 131-9.000.
Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, to Sumitomo Chemical Company, Limited. Process for producing an aqueous dispersion of vinyl acetate-ethylene copolymer including an epoxide compound. 4,108,819, Cl. 260-29.6NR.
Ozaki, Kiyotaka: *See*—
Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.
Ozdemir, Faik S.; and Loper, Dall D., to Hughes Aircraft Company. High resolution electron beam microfabrication process for fabricating small geometry semiconductor devices. 4,109,029, Cl. 427-84.000.
Ozeki, Hideyoshi: *See*—
Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, 4,108,675, Cl. 106-56.000.
P.F.W. Beheer B.V.: *See*—
de Haan, Douwe Rienk; and Kettenes, Dirk Karel, 4,109,022, Cl. 426-538.000.
Packaging Laminators, Inc.: *See*—
Johnson, Kenneth M., 4,107,861, Cl. 40-2.00R.
Padilla, Dominick: *See*—
Hacker, Morris; and Padilla, Dominick, 4,109,252, Cl. 343-715.000.
Page, Darrell, to Sargent Fletcher Company. Aircraft fuel tank construction. 4,108,328, Cl. 220-5.00A.
Paitson, John Lloyd; and Hendley, Robert N., to Western Geophysical Co. of America. Rapid fire air gun. 4,108,272, Cl. 181-120.000.
Palmer, Harold R. Digital dwell-tachometer with points resistance indication capability. 4,109,195, Cl. 324-15.000.
Palosi, Eva: *See*—
Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.
Palumbo, Luigi; Colletta, Angelo; and Giromella, Giampaolo, to Centro Sperimentale Metallurgico S.p.A. Coke production. 4,108,731, Cl. 201-8.000.
Pan, Michael, to Hewlett-Packard Company. Wristwatch calculator with selectively scanned keyboard. 4,109,315, Cl. 364-705.000.
Pankove, Jacques Isaac, to RCA Corporation. Amorphous silicon-amorphous silicon carbide photovoltaic device. 4,109,271, Cl. 357-30.000.
Pantek, Stanley J. Multiple use canner. 4,108,220, Cl. 141-98.000.
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., to American Cyanamid Company. Propionimidate hydrohalides. 4,108,883, Cl. 260-453.0RW.
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., to American Cyanamid Company. Addition polymers of unsaturated imidazolines. 4,109,072, Cl. 526-258.000.
Paolucci, Paride: *See*—
Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.
Pap, Laszlo: *See*—
Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, 4,107,851, Cl. 34-10.000.
Pappas, Charles, to United Merchants and Manufacturers, Inc. Method for coloring textile fabrics and fabrics produced therefrom. 4,108,595, Cl. 8-1.00A.

Pardo, Brian D.: *See*—
Kelly, John C.; and Pardo, Brian D., 4,107,928, Cl. 60-650.000.

Parker, Howard E.: *See*—
Steinberg, Walter A.; and Parker, Howard E., 4,109,187, Cl. 318-572.000.

Parker, Robert Sydney Richard, to National Research Development Corporation. Hardenable sheet materials for surgical splints. 4,108,169, Cl. 128-89.00R.

Parrish, David Richard: *See*—
Hajos, Zoltan George; and Parrish, David Richard, 4,108,898, Cl. 260-586.00C.

Parsons, John T., to Lightning Fasteners Limited. Narrow fabrics. 4,107,956, Cl. 66-195.000.

Partain, James H., to Stone Container Corporation. Multiple partition structure for paperboard container. 4,108,348, Cl. 229-15.000.

Pasco, Wayne D.: *See*—
Klug, Frederic J.; and Pasco, Wayne D., 4,108,672, Cl. 106-38.900.

Patch, Bradley J., Jr.: *See*—
Zampiello, Albert N.; and Patch, Bradley J., Jr., 4,108,553, Cl. 356-106.0LR.

Patinet, Jean-Francois; and Guiomard, Claude, to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C. G. Doris". Apparatus for releasing submerged floats. 4,107,802, Cl. 9-400.000.

Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich. Electroslag remelting apparatus having relative mold movement and provision for introduction of slag. 4,108,235, Cl. 164-252.000.

Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Easy open container end assembly. 4,108,330, Cl. 220-260.000.

Pauli, Jude A., to Emerson Electric Co. Retaining means for a solenoid assembly. 4,109,221, Cl. 335-251.000.

Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, to Stahlwerke Peine-Salzgitter A.G. Steel wire. 4,108,695, Cl. 148-39.000.

Payet, George L., to Strike Corporation, The. Durable press process. 4,108,598, Cl. 8-115.700.

Paynter, Henry M. Fluid-driven torsional operators for turning rotary valves and the like. 4,108,050, Cl. 92-48.000.

Pearson, Bert David; and Kissane, Richard J., to Baxter Travenol Laboratories, Inc. Blood gas simulator. 4,108,607, Cl. 23-253.00R.

Pearson, Edward K., to Raymond Lee Organization, Inc., The. Quick extinguishing ash tray. 4,108,153, Cl. 131-235.00R.

Pearson, Michael John; and Branch, Clive Leslie, to Beecham Group Limited. Cephalosporin analogues and compositions. 4,108,992, Cl. 424-248.530.

Peart, Norman Eli, to Ferranti, Limited. Cathode ray tube assemblies. 4,109,220, Cl. 335-212.000.

Pecherer, Benjamin: *See*—
Avenia, Richard William; and Pecherer, Benjamin, 4,108,973, Cl. 424-1.000.

Pedain, Josef: *See*—
Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, 4,108,842, Cl. 528-61.000.

Peddinghaus, Werner; and Regenbrecht, Ludwig, to Werner Peddinghaus. Drilling device with tool carrier supported by a carriage displaceable in drilling direction. 4,108,564, Cl. 408-10.000.

Pell, Christopher: *See*—
Knowles, Philip Neville George; and Pell, Christopher, 4,109,248, Cl. 343-6.50R.

Pelsue, Bradley A.; and Beavers, Allan E., to T.A. Pelsue Company. Forced air heater blower. 4,108,143, Cl. 126-110.00B.

Pennwalt Corporation: *See*—
Howland, Paul George; and Alexander, John Mergle, 4,108,338, Cl. 222-286.000.
Moneghan, Edward, 4,108,935, Cl. 264-68.000.
Thomas, Paul Vernon, 4,108,780, Cl. 252-8.600.

Peppard, James P. K.: *See*—
Miller, James Clayton; Proefrock, Paul R.; and Peppard, James P. K., 4,107,965, Cl. 70-52.000.

Percival, Albert, to Fisons Limited. Halogenated alkylsulphonyl-benzimidazoles. 4,109,004, Cl. 424-273.00R.

Perkin-Elmer Corporation, The: *See*—
Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, 4,108,608, Cl. 23-259.000.

Pernegger, Wolfgang: *See*—
Helder, Johan; De Steur, Hubert; and Pernegger, Wolfgang, 4,108,555, Cl. 356-184.000.

Perrino, Joseph A., to Micro Electronics, Inc. Wire stripper having replaceable blades. 4,108,028, Cl. 81-9.50B.

Perronnet, Jacques: *See*—
Bonne, Claude; Perronnet, Jacques; and Teche, Andre, 4,108,993, Cl. 424-248.570.

Peschke, Gordon C., to Uarco Incorporated. Continuous business forms assembly with anti-tenting means. 4,108,352, Cl. 229-69.000.

Peter Eckrich and Sons, Inc.: *See*—
Griswold, George G., 4,108,030, Cl. 83-77.000.

Peter, Wolfgang; Koch, Heinz; and Stubenvoll, Alfred, to Daimler-Benz Aktiengesellschaft. Process for improving the surfaces of roller bodies and balls. 4,108,689, Cl. 148-6.15R.

Peters, Alan H.: *See*—
Wilkes, Robert D.; Peters, Alan H.; and Jacuzzi, Virgil J., 4,108,775, Cl. 210-169.000.

Peters, George. Decorative wind velocity and directional indicator. 4,107,989, Cl. 73-189.000.

Peters, Martinus T. J., to Oce-van der Grinten N.V. Pressure-fixable toner powder with a thermoplastic polyethylene binder. 4,108,653, Cl. 96-1.0SD.

Peters, Wolfgang: *See*—
Hauschopp, Alois; and Peters, Wolfgang, 4,108,495, Cl. 299-43.000.

Petersen, Ole Simon, to S. P. Radio A/S. Coding member for programming of a radio communication apparatus. 4,109,207, Cl. 325-455.000.

Peterson, Harold L.: *See*—
Mendrala, James A.; and Peterson, Harold L., 4,109,278, Cl. 358-22.000.

Petin, Christian; and Richardson, Robert, to Petin, Christian. Cooking oven and method of manufacture. 4,108,138, Cl. 126-19.00R.

Petro-Data C.A.: *See*—
King, David W.; and Rankin, Emmitt Edward, 4,108,243, Cl. 166-66.000.

Pettinger, Siegfried. Carrying belt for batteries. 4,108,341, Cl. 224-5.00H.

Petzinger, Manfred Wilhelm August. Compost container. 4,108,609, Cl. 23-259.100.

Pfaff Industriemaschinen G.m.b.H.: *See*—
Gross, Helmut; and Klundt, Kurt, 4,108,097, Cl. 112-287.000.

Pfaffendorf, James L., to Boise Cascade Corporation. Space divider for cartons and the like. 4,108,349, Cl. 229-15.000.

Pfalzstahlbau GmbH: *See*—
Kuwertz, Erich, 4,108,078, Cl. 104-172.00S.

Pfizer Inc.: *See*—
Barth, Wayne E., 4,109,083, Cl. 544-26.000.
Barth, Wayne E., 4,109,085, Cl. 544-30.000.

Philippaerts, Herman Adelbert: *See*—
Vanassche, Willy Joseph; Philippaerts, Herman Adelbert; Duville, Rene Omer; and Schelfaut, Francois Leon, 4,108,661, Cl. 96-59.000.

Phillips, David C.: *See*—
Smith, James D. B.; and Phillips, David C., 4,108,001, Cl. 73-339.00R.

Phillips Petroleum Company: *See*—
Cook, Charles F.; and Hays, George E., 4,108,244, Cl. 166-268.000.

Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, to Dresser Industries, Inc. Degasser spray vessel. 4,108,619, Cl. 55-192.000.

Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, to Montedison S.p.A. Insecticide carbamates of N-(polychloroallyl)-amino-phenols. 4,109,011, Cl. 424-300.000.

Pick, Peter: *See*—
Hintner, Josef; and Pick, Peter, 4,108,501, Cl. 303-82.000.

Picker Corporation: *See*—
Martone, Ronald J.; Goldman, Samuel C.; and Heaton, Clifford C., 4,109,150, Cl. 250-368.000.
Pleil, Viktor W., 4,109,151, Cl. 250-460.000.

Piech, Ferdinand: *See*—
Hanle, Edgar; and Piech, Ferdinand, 4,109,133, Cl. 219-203.000.

Pieroh, Ernst Albrecht: *See*—
Hoyer, Georg-Alexander; and Pieroh, Ernst Albrecht, 4,108,885, Cl. 260-455.00A.

Pierrard, Francois: *See*—
L'Hermite, Mathurin; Le Bossenec, Raymond; Godart, Pierre; and Pierrard, Francois, 4,108,693, Cl. 148-16.500.

Piet, Meyer; and Giles, Dean Gaylord, to Futurecraft Corporation. Controlled environment work enclosure. 4,108,509, Cl. 312-1.000.

Pigeon, Michel; and Saglio, Robert, to Commissariat a l'Energie Atomique. Measuring bridge for an inspection or checking device by means of eddy currents. 4,109,201, Cl. 324-227.000.

Pigerol, Charles; de Fillain, Paul de Cointet; Grain, Claude; and Le Blay, Jacques, to Labaz. Thiophene compounds and the production thereof. 4,108,865, Cl. 260-329.00R.

Pilgram, Kurt H. G., to Shell Oil Company. Herbicidal semicarbazones. 4,108,399, Cl. 542-417.000.

Pilkington Brothers Limited: *See*—
Cockram, David Ralph, 4,109,051, Cl. 428-375.000.

Pilot Man-Nun-Hitsu Kabushiki Kaisha: *See*—
Kawai, Satoshi; Sato, Hajime; and Sakai, Toshimatsu, 4,109,287, Cl. 360-131.000.

Pioneer Electronic Corporation: *See*—
Kanazashi, Tetsuo; and Fujiwara, Tsuyoshi, 4,109,281, Cl. 358-114.000.
Numata, Tatsuo, 4,109,206, Cl. 325-319.000.

Pirc, Vladimir Valentine: *See*—
Maher, Francis William, Jr.; and Pirc, Vladimir Valentine, 4,108,608, Cl. 23-259.000.

Pistor, Michel Louis Paul. Automatic injector device. 4,108,177, Cl. 128-218.00A.

Pitney-Bowes, Inc.: *See*—
Eckert, Alton B., Jr.; and Gluck, Julius, 4,108,545, Cl. 355-14.000.

Pittet, Alan Owen: *See*—
Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.

Piziali, Robert L.: *See*—
Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., 4,108,432, Cl. 273-29.00A.

Pizzuti, Donato F.; and Lippert, Irving S., to Polaroid Corporation. Battery mount for collapsible cameras. 4,109,264, Cl. 354-187.000.

Plasko, Emil Robert, to Emerson Electrical Co. Thermally actuatable electrical switch subassembly thereof. 4,109,229, Cl. 337-408.000.

Platt, Charles Elmore, to United Technologies Corporation. Composite rotor blade. 4,108,572, Cl. 416-230.000.

Platz, Winfried: *See—*
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,109,155, Cl. 250-505.000.

Pleil, Viktor W., to Picker Corporation. Dual filament X-ray tube used in production of fluoroscopic images. 4,109,151, Cl. 250-460.000.

Plessey Handel und Investments AG: *See—*
Knowles, Philip Neville George; and Pell, Christopher, 4,109,248, Cl. 343-6.50R.

Ploger, Walter; and Gutzschebauch, Claus, to Henkel Kommanditgesellschaft auf Aktien. Process of stabilization of anhydrous dibasic calcium phosphate against fluorine ions with azacycloalkane-2,2-diphosphonic acids. 4,108,961, Cl. 423-265.000.

Ploger, Walter; and Gutzschebauch, Claus, to Henkel Kommanditgesellschaft auf Aktien. Process of stabilization of anhydrous dibasic calcium phosphate against fluorine ions with 3-amino-1-hydroxypropane-1,1-diphosphonic acid. 4,108,962, Cl. 423-265.000.

Plum, Hans; Buschhoff, Max; and Cejka, Alena, to Schering Aktiengesellschaft. Method of killing bacteria and fungi. 4,108,990, Cl. 424-245.000.

PMC Industries, Inc.: *See—*
Boehnlein, James E., 4,107,848, Cl. 33-174.00P.

Pneumeric Corp.: *See—*
Hawley, Jack S., 4,108,205, Cl. 137-554.000.

Pockman, Thomas W.: *See—*
Pockman, William W.; and Pockman, Thomas W., 4,107,912, Cl. 57-68.000.

Pockman, William W.; and Pockman, Thomas W. Metering capstan. 4,107,912, Cl. 57-68.000.

Pocock, John F. E.: *See—*
Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.

Pohle, Werner: *See—*
Beismann, Walter; Lampe, Hans Hermann; and Pohle, Werner, 4,108,360, Cl. 235-304.000.

Pohto, Gerald R.; and Kubrin, Michael Joseph, to Diamond Shamrock Corporation. Electrolytic cell bank having spring loaded intercell connectors. 4,108,752, Cl. 204-256.000.

Poittevin, Andre; Derible, Pierre Henri; and Fournex, Robert, to Rousel Uclaf. 5-Thiazole-methane-amines, and their use as antilipolytics. 4,108,994, Cl. 424-250.000.

Poland, Robert L.: *See—*
Anderson, Carl M.; and Poland, Robert L., 4,108,249, Cl. 172-328.000.

Polaroid Corporation: *See—*
Johnson, Bruce K., 4,109,263, Cl. 354-150.000.
Pizzuti, Donato F.; and Lippert, Irving S., 4,109,264, Cl. 354-187.000.
Tarr, Fred P., 4,109,259, Cl. 354-86.000.
Wareham, Richard R., 4,109,302, Cl. 362-10.000.

Polgari, Istvan: *See—*
Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.

Pollak-Banda, Erich: *See—*
John, Erich; Oesterle, Albert; and Pollak-Banda, Erich, 4,108,018, Cl. 74-467.000.

Polsky, Lawrence M. Navigation aid for sailing vessels. 4,107,988, Cl. 73-178.00R.

Ponsinet, Gerard: *See—*
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,108,999, Cl. 424-258.000.

Portnoy, Norman A.; Arthur, Jett C., Jr.; Margavio, Matthew F.; and Nelson, Marie C., to United States of America, Agriculture. Photofinishing of cotton textiles. 4,108,748, Cl. 204-159.120.

Potschka, Joseph: *See—*
Dietrich, Hagen; Fane, William J.; and Potschka, Joseph, 4,108,482, Cl. 292-165.000.

Potter, Edward, to Potter, Edward; and Dant & Russell, Inc. Non-metallic-reinforced molded crosstie. 4,108,377, Cl. 238-91.000.

Potter, Vernon L., to United States of America, Navy. Low heat loss liquid helium disconnect attachment and system. 4,107,946, Cl. 62-514.00R.

Potts, Everett L., Jr.: *See—*
Craig, Gerald; Evans, Wilbur G.; and Potts, Everett L., Jr., 4,109,056, Cl. 428-512.000.

Pouli, Dirk: *See—*
Cipris, Divna; and Pouli, Dirk, 4,108,745, Cl. 204-129.000.

PPG Industries, Inc.: *See—*
Cherenko, Joseph; and Lewis, Charles W., 4,109,055, Cl. 428-437.000.
Claassen, George Richard, 4,108,624, Cl. 65-273.000.
Friedlander, Charles B., 4,108,840, Cl. 528-46.000.
Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,108,750, Cl. 204-181.00R.
Kacirek, Kenneth J.; and Rust, Jack E., 4,108,319, Cl. 214-6.0BA.
Steiger, Roger A.; and Stroke, Frederick G., 4,108,670, Cl. 106-40.00R.

Precision Monolithics, Inc.: *See—*
Comer, Donald Thomas; Dooley, Daniel Joseph; Erdi, George; and Henneuse, Paul Raymond, 4,109,215, Cl. 330-254.000.

Precision Paper Tube Company: *See—*
Thomas, Anthony Vincent, 4,108,034, Cl. 83-361.000.

Premo, Richard W.: *See—*
Minden, Henry Thomas; and Premo, Richard W., 4,109,135, Cl. 219-216.000.

Prigent, Yvon: *See—*
Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, 4,109,153, Cl. 250-499.000.

Prikkel, John, III. Automatic flue damper. 4,108,369, Cl. 236-1.00G.

Pritchard, Assunta Anna; and Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Polishing of CdS crystals. 4,108,716, Cl. 156-636.000.

Pritchett, Ervin G., to National Distillers and Chemical Corporation. Compatibilization of thermoplastic copolymers. 4,108,948. Cl. 260-897.00B.

Process Computer Systems, Inc.: *See—*
Barnich, Richard G.; and Hakeem, Timothy M., 4,109,244, Cl. 340-324.0AD.

Prochazka, Svante; and Dondalski, William J., to General Electric Company. Hot pressed silicon carbide. 4,108,929, Cl. 264-29.100.

Procter & Gamble Company, The: *See—*
Bates, Paul Edward; Hughes, John Ronald; and Zoueshtiagh, Nahid, 4,109,012, Cl. 426-302.000.
Connor, Daniel Stedman, 4,108,889, Cl. 260-502.40R.
Mast, John George, Jr., 4,108,299, Cl. 28-119.000.
Wong, Louis Fay, 4,108,600, Cl. 8-137.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Arsac, Aime Joseph; and Frank, Pierre, 4,109,093, Cl. 548-334.000.
Cuer, Jean-Pierre; and Floreancig, Antoine, 4,108,963, Cl. 423-321.00S.

Proefrock, Paul R.: *See—*
Miller, James Clayton; Proefrock, Paul R.; and Peppard, James P. K., 4,107,965, Cl. 70-52.000.

Progessive Machine Products, Inc.: *See—*
Betush, Frank A., 4,108,178, Cl. 128-224.000.

Proksa, Ferdinand; Raffel, Reiner; and Althausen, Ferdinand, to Maschinenfabrik Hennecke GmbH. Apparatus for the continuous production of foam plastic blocks of rectangular cross-section. 4,108,585, Cl. 425-89.000.

Prontophot Holding AG: *See—*
Brands, Jacobus; and Thaddey, Kurt, 4,108,706, Cl. 156-384.000.

Prontor-Werk Alfred Gauthier GmbH: *See—*
Theurer, Richard, 4,109,267, Cl. 354-266.000.

Proto, Richard C., to United States of America, Army. Apparatus for verifying the execution of a sequence of coded instructions. 4,108,359, Cl. 235-304.000.

Pullman Incorporated: *See—*
Weir, Gary L., 4,108,472, Cl. 280-763.000.

Purdue Research Foundation: *See—*
Regnier, Frederick E.; and Chang, Shung-Ho, 4,108,603, Cl. 23-230.00B.
Rickey, Frank A., Jr.; Simms, Paul C.; and Butler, Neal R., 4,108,718, Cl. 159-30.000.

Putt, Mark S.: *See—*
Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,979, Cl. 424-49.000.
Muhler, Joseph C.; Putt, Mark S.; and Kleber, Carl J., 4,108,981, Cl. 424-55.000.

Quaker Oats Company, The: *See—*
Anderson, Hugh C.; and Lembke, Russell B., 4,108,826, Cl. 260-395.00B.

Quinlan, John R., to Smith International, Inc. Rock bit roller cutter and method therefor. 4,108,692, Cl. 148-12.300.

Quinn, Edwin J.: *See—*
Dieck, Ronald L.; and Quinn, Edwin J., 4,108,805, Cl. 521-180.000.

R. M. Wade & Co.: *See—*
Cornelius, Gail, 4,108,200, Cl. 137-344.000.

Racca, Enrico R. Apparatus for storing toiletries in a shower. 4,108,314, Cl. 211-74.000.

Rackman, Michael I. Method of playing a board game. 4,108,438, Cl. 273-120.00R.

Rackman, Michael I. Board game. 4,108,443, Cl. 273-243.000.

Rackman, Michael I.: *See—*
Matthew, Morton P.; and Rackman, Michael I., 4,108,430, Cl. 273-1.00R.

Racunas, Bernard J.: *See—*
Jacobs, Stanley C.; King, Larry K.; and Racunas, Bernard J., 4,108,968, Cl. 423-495.000.

Radice, Michael; and Sheffler, Robert J., to Revlon, Inc. Lipstick dispenser. 4,108,558, Cl. 401-78.000.

Radzins, Edmund A.; and Kiela, Gene F., to Curt G. Joa, Inc. Fluff distributor. 4,108,584, Cl. 425-83.100.

Raffel, Reiner: *See—*
Proksa, Ferdinand; Raffel, Reiner; and Althausen, Ferdinand, 4,108,585, Cl. 425-89.000.

Rahman, Abdul R.; and Haralampu, Stephen G., to United States of America, Army. Process for producing compacted, dehydrated, uncooked cabbage and cabbage product thereof. 4,109,026, Cl. 426-640.000.

Rahman, Abdul R.: *See—*
Gorfien, Harold; Rahman, Abdul R.; and Westcott, Donald E., 4,109,020, Cl. 426-241.000.

Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, to Metall-

gesellschaft Aktiengesellschaft; and Deutsche Babcock Aktiengesellschaft. Process for thermally treating fine-grained solids. 4,108,634, Cl. 75-23.000.

Rainsfords Metal Products Proprietary Limited: *See—*
Heath, Robert Boyson, 4,108,395, Cl. 242-107.700.

Ramlow, Kurt: *See—*
Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, 4,109,048, Cl. 428-325.000.

Randall, John P. Floating buffing wheel assembly. 4,107,880, Cl. 51-103.0TF.

Randolph, Arthur J. Hydraulic bagging press. 4,108,063, Cl. 100-53.000.

Rankin, Emmitt Edward: *See—*
King, David W.; and Rankin, Emmitt Edward, 4,108,243, Cl. 166-66.000.

Ranpak Corporation: *See—*
Ottaviano, Gary W., 4,109,040, Cl. 428-129.000.

Rast, Robert Morgan, to RCA Corporation. Frequency counter for a television tuning system. 4,109,283, Cl. 358-191.000.

Rathje, Uwe; and Schumacher, Hans Jurgen, to O & K Orenstein & Koppel Aktiengesellschaft. Vehicle with adjusting device for earth-moving shield thereof. 4,108,251, Cl. 172-789.000.

Ratledge, R. Houston, Jr.: *See—*
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,108,261, Cl. 177-120.000.

Ratte, Jacques; and Carignan, Pierre, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Cold molding of flexible articles. 4,108,940, Cl. 264-140.000.

Ray, Orlando F.; and Gutierrez, Enrique H., to Systems Concept, Inc. Prefabricated building module. 4,107,886, Cl. 52-79.110.

Ray, Roggie C.: *See—*
Claiborne, Floyd H.; and Ray, Roggie C., 4,108,189, Cl. 134-138.000.

Raymond, David Lee, to Analog Technology Corporation. Current-to-frequency converter. 4,109,168, Cl. 307-271.000.

Raymond Lee Organization, Inc., The: *See—*
Extine, James M., 4,108,421, Cl. 254-88.000.
Pearson, Edward K., 4,108,153, Cl. 131-235.00R.
Yanke, James N., 4,108,015, Cl. 74-421.00A.

Raymond, Roger. Railroad tie and tie plate with coacting grooves and projections that prevent spike killing of the ties. 4,108,378, Cl. 238-298.000.

Raytheon Company: *See—*
McKinnon, John J., 4,109,179, Cl. 315-39.750.
Unkauf, Manfred G., 4,109,100, Cl. 178-67.000.
Zampiello, Albert N.; and Patch, Bradley J., Jr., 4,108,553, Cl. 356-106.0LR.

RB Toy Development Co.: *See—*
Kupperman, Sam; and Kupperman, Dennis, 4,108,104, Cl. 116-148.000.

RCA Corporation: *See—*
Bismarck, Otto Herbert, 4,109,209, Cl. 328-60.000.
Cable, Walter Lester; Binge, Derek Sidney; and Korosec, Rudolph Francis, 4,108,407, Cl. 248-23.000.
Callaghan, John David, 4,109,191, Cl. 318-673.000.
Castellano, Joseph Anthony; and McCaffrey, Michael Thomas, 4,108,793, Cl. 252-299.000.
Catanese, Carmen Anthony; Endriz, John Guiry; and Keneman, Scott Allen, 4,109,178, Cl. 315-12.00R.
Channin, Donald Jones, 4,109,242, Cl. 340-324.00M.
Clark, Charles Albert, Jr.; and Adam, Kenneth Charles, 4,109,166, Cl. 307-237.000.
Cosentino, Louis Salvatore; Endriz, John Guiry; and Stockdale, George Fairbank, 4,109,299, Cl. 361-412.000.
Gale, Michael Thomas; and Kane, James, 4,108,660, Cl. 96-38.200.
Godfrey, Richard Hugh; and Morrell, Albert Maxwell, 4,109,177, Cl. 313-402.000.
Hannan, William James, 4,108,367, Cl. 235-457.000.
Hopkins, Robert Sherman, Jr.; Banks, Arthur James; and Dischert, Robert Adams, 4,109,276, Cl. 358-4.000.
Jacobus, Lewis Alfred, Jr., 4,108,686, Cl. 148-1.500.
Kaplan, Gerald Stanley, 4,109,247, Cl. 343-6.50R.
Kudsia, Chandra Mohan; Moody, Harry John; and Keyes, Lorne Allan, 4,109,202, Cl. 325-3.000.
Pankove, Jacques Isaac, 4,109,271, Cl. 357-30.000.
Rast, Robert Morgan, 4,109,283, Cl. 358-191.000.
Shambelan, Robert Charles; and Lindsley, Charles Wesley, 4,108,323, Cl. 214-310.000.

Readal, Gerald J.; Tiskus, John R.; and Tomcanin, William J., to United States Steel Corporation. Process data tracking system. 4,109,142, Cl. 235-92.0DN.

Rebhun, Charles F., to True Temper Corporation. Weed cutter construction. 4,107,841, Cl. 30-276.000.

Reese, Max G., to Becton, Dickinson and Company. Automated direct serum radioimmunoassay. 4,108,976, Cl. 424-1.000.

Regenbrecht, Ludwig: *See—*
Peddinghaus, Werner; and Regenbrecht, Ludwig, 4,108,564, Cl. 408-10.000.

Regie Nationale des Usines Renault: *See—*
Bouthors, Pierre Marcel, 4,109,235, Cl. 340-52.00F.

Regnier, Frederick E.; and Chang, Shung-Ho, to Purdue Research Foundation. Method for rapid analysis of hemoglobin variants by high speed liquid chromatography. 4,108,603, Cl. 23-230.00B.

Reh, Lothar: *See—*
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.

Reiff, Helmut; Wenzel, Wolfgang; Grammel, Jurgen; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Aqueous polyurethane dispersions from solvent-free prepolymers using sulfonate diols. 4,108,814, Cl. 260-29.2TN.

Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Circuit card connector and support device. 4,109,300, Cl. 361-415.000.

Reinehr, Ulrich; Nogaj, Alfred; and Lorenz, Gunter, to Bayer Aktiengesellschaft. Highly shrinkable acrylic fibres or filaments. 4,108,845, Cl. 526-240.000.

Reisdorf, Daniel: *See—*
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,108,999, Cl. 424-258.000.

Reiser, Mario: *See—*
Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.

Reliable Attachment Company: *See—*
Weigert, Karl, 4,108,094, Cl. 112-134.000.

Reliance Electric Company: *See—*
Meyer, Stephen F.; Helle, Amiel R.; and Niese, Leo J., 4,109,314, Cl. 364-552.000.

Remington Arms Company, Inc.: *See—*
Dawson, Chester H., 4,107,983, Cl. 73-100.000.

Renis, Giovanni: *See—*
Piccardi, Paolo; Paolucci, Paride; Gozzo, Franco; Longoni, Angelo; Dongiovanni, Vincenzo; and Renis, Giovanni, 4,109,011, Cl. 424-300.000.

Renner, Wolf; and Mauer, Dieter, to USM Corporation. Through-wall cable support. 4,108,507, Cl. 308-238.000.

Rensch, Eberhard G. Prefabricated building structure. 4,107,893, Cl. 52-775.000.

Repapress AG: *See—*
Hirmann, Georg, 4,108,486, Cl. 294-99.00R.

Research Corporation: *See—*
Silverstein, Emanuel, 4,108,726, Cl. 195-103.50R.

Resilient Grip Limited: *See—*
Varga, Otto Herman, 4,108,043, Cl. 85-70.000.

Reuschel, Konrad: *See—*
Keller, Wolfgang; and Reuschel, Konrad, 4,108,714, Cl. 156-608.000.

Reuter, Franz Gottfried: *See—*
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,807, Cl. 521-118.000.
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,954, Cl. 264-216.000.

Reuter, Helge: *See—*
Skrzipek, Jurgen; and Reuter, Helge, 4,108,557, Cl. 400-697.100.

Reuter Technologie GmbH: *See—*
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,807, Cl. 521-118.000.
Hilterhaus, Karl Heinz; and Reuter, Franz Gottfried, 4,108,954, Cl. 264-216.000.

Revere Copper and Brass, Incorporated: *See—*
Hemming, Donald C.; Hahn, Robert E.; and Robinson, John W., Jr., 4,108,596, Cl. 8-94.270.

Revesz, Clara: *See—*
Gauthier, Jean A.; Humber, Leslie G.; and Revesz, Clara, 4,108,997, Cl. 424-256.000.

Revlon, Inc.: *See—*
Radice, Michael; and Sheffler, Robert J., 4,108,558, Cl. 401-78.000.

Rexroth-Sigma: *See—*
Bitton, Georges, 4,108,582, Cl. 418-132.000.

Reynolds, Bruce R.: *See—*
Abel, Irving R.; and Reynolds, Bruce R., 4,109,149, Cl. 250-347.000.

Reynolds, Howard, to General Electric Company. Fuse holder assembly field convertible from fuse non-rejecting to rejecting modes. 4,108,531, Cl. 339-258.00F.

Reynolds, James E., to Hazen Research Inc. Solder skimmings recovery process. 4,108,635, Cl. 75-24.000.

Rezanka, Ivan, to Xerox Corporation. Cleaning apparatus and electrostatographic reproducing machine. 4,108,546, Cl. 355-15.000.

Rhodes, Thomas J. Stair-climbing wheelchair. 4,108,449, Cl. 280-5.280.

Rhone-Poulenc Industries: *See—*
Azemar, Michel; and Vigliecca, Lucien, 4,109,069, Cl. 526-65.000.
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,108,999, Cl. 424-258.000.
Jay, Pierre; and Schwachhofer, Ghislain, 4,108,789, Cl. 252-64.000.

Rice, Richard E., to Comstook & Wescott, Inc. Catalyst for self ignition of fuels. 4,108,797, Cl. 252-466.0PT.

Richardson, David A. Sprouter. 4,107,874, Cl. 47-14.000.

Richardson, James L., to VEDA, Inc. Tank spreader. 4,108,380, Cl. 239-172.000.

Richardson-Merrell Inc.: *See—*
Miller, Laird F.; and Fleming, Robert W., 4,108,896, Cl. 260-570.50C.

Richardson, Robert: *See—*
Petin, Christian; and Richardson, Robert, 4,108,138, Cl. 126-19.00R.

Riche, Jean Charles: *See—*
Brachet, Guy; Demichel, Pascal; Prigent, Yvon; and Riche, Jean Charles, 4,109,153, Cl. 250-499.000.

Richlin, Milton. Dye-based inks with improved vehicles. 4,108,671, Cl. 106-22.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.

Mago nee Karacsony, Erzsebet; Bajusz, Sandor; Borsi, Jozsef; Kiraly, Ildiko; Csanyi, Endre; and Polgari, Istvan, 4,108,855, Cl. 260-285.500.
Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, 4,107,851, Cl. 34-10.000.
Richter, Stephan: *See*—
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.
Rickey, Frank A., Jr.; Simms, Paul C.; and Butler, Neal R., to Purdue Research Foundation. Vapor filtration process and system. 4,108,718, Cl. 159-30.000.
Ricoh Co., Ltd.: *See*—
Ohta, Masafumi; Hashimoto, Mitsuru; and Kozima, Akio, 4,108,656, Cl. 96-1.50R.
Ricoh Watch Co., Ltd.: *See*—
Muranishi, Kenichi, 4,108,016, Cl. 74-462.000.
Riecke, Kurt: *See*—
Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, 4,109,048, Cl. 428-325.000.
Riedel-de Haen Aktiengesellschaft: *See*—
Lieser, Karl Heinrich; and Burba, Peter, 4,109,080, Cl. 536-43.000.
Riek, Rodney G.: *See*—
Flemings, Merton C.; Riek, Rodney G.; and Young, Kenneth P., 4,108,643, Cl. 75-135.000.
Riely, Phyllis Eleanor: *See*—
Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, 4,108,728, Cl. 195-127.000.
Riemens, Karel: *See*—
Eggermont, Ludwig Desire Johan; Dijkmans, Eise Carel; and Riemens, Karel, 4,109,203, Cl. 325-38.00B.
Rieter Machine Works Ltd.: *See*—
Schar, Hugo, 4,108,388, Cl. 242-18.0DD.
Right, Robert W.: *See*—
Budrys, Ignas; and Right, Robert W., 4,109,246, Cl. 340-518.000.
Rigo, Serge; and Siejka, Julius, to Agence Nationale de Valorisation de la Recherche (Anvar). Method of producing protective coatings. 4,108,736, Cl. 204-1.500.
Ringwall, Carl G., to General Electric Company. Fluidic flow and velocity sensor. 4,107,990, Cl. 73-194.00B.
Ripper, Wolfgang: *See*—
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Ripple, David Eugene, to Lubrizol Corporation, The. Haloalkyl hydroxy-aromatic condensation products as fuel and lubricant additives. 4,108,783, Cl. 252-54.600.
Riva, Ralph D. Carrier attachment for automobiles. 4,108,342, Cl. 224-42.010.
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Sarti, Vincenzo; Bertone, Antonino; and Rivetti, Enrico, 4,108,273, Cl. 180-148.000.
Rizzo, Anthony A., to TRW Inc. Caging device. 4,108,424, Cl. 267-160.000.
RMS Electronics, Inc.: *See*—
Hacker, Morris; and Padilla, Dominick, 4,109,252, Cl. 343-715.000.
Robbins, Kenneth W.; and Ross, Gerald F., to Sperry Rand Corporation. Geothermal well pump performance sensing system and monitor therefor. 4,107,987, Cl. 73-151.000.
Robbins, Murray: *See*—
Ballman, Albert Anthony; and Robbins, Murray, 4,108,970, Cl. 423-593.000.
Robens, Erich: *See*—
Bohme, Gotthold; Robens, Erich; Binder, Horst; and Langbein, Dieter, 4,108,620, Cl. 55-210.000.
Robert Bosch GmbH: *See*—
Knapp, Heinrich, 4,108,128, Cl. 123-139.0AW.
Stroezel, Reinhold, 4,108,252, Cl. 173-12.000.
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Wanner, Karl; and Voss, Klaus, 4,107,949, Cl. 64-9.00A.
Wossner, Gunter, 4,107,922, Cl. 60-298.000.
Roberts, Albert Lee. Cementitious flooring composition containing mixture of intermeshing particles of substantially spherical quartz sand. 4,108,813, Cl. 260-29.60S.
Roberts, Joseph A., to Advanced Circuit Technology. Circuit board with self-locking terminals. 4,107,836, Cl. 29-625.000.
Robertshaw Controls Company: *See*—
Bauer, Werner R.; and Smith, William N., 4,109,121, Cl. 200-67.00E.
Brakebill, Harold G., 4,108,197, Cl. 137-81.000.
Brakebill, Harold G., 4,108,372, Cl. 236-86.000.
Demi, Roy C., 4,108,370, Cl. 236-15.00A.
Tyler, Hugh J., 4,109,120, Cl. 200-51.00R.
Robertson, James Rennie: *See*—
Ryall, Michael Leslie; and Robertson, James Rennie, 4,108,569, Cl. 415-112.000.
Robertson, Penrose David; and Coulouris, George Franklin, to National Research Development Corporation. Apparatus and method for printing information onto a surface. 4,109,282, Cl. 358-127.000.
Robinson, Frank; and Whatmough, Nigel Stephen, to Courtaulds Limited. Method of knitting blank for a sleeved garment and product thereof. 4,107,955, Cl. 66-176.000.
Robinson, John W., Jr.: *See*—
Hemming, Donald C.; Hahn, Robert E.; and Robinson, John W., Jr., 4,108,596, Cl. 8-94.270.
Robinson, John William; and Wilcox, Brian Norris, to Kimball International, Inc. Electronic organ having different selectable modes of playing the accompaniment keyboard. 4,108,037, Cl. 84-1.030.
Rocco, Andrew. Fuel vaporizing device. 4,108,953, Cl. 261-142.000.
Roche, Pierre: *See*—
Onillon, Michel; Roche, Pierre; and Thenard, Jean, 4,109,159, Cl. 250-564.000.
Rockwell International Corporation: *See*—
Christe, Karl O., 4,108,965, Cl. 423-351.000.
Rockwool Aktiebolaget: *See*—
Dahlberg, Stellan, 4,108,344, Cl. 226-1.000.
Rode, Walter F.; and Jones, Bill R., to Sedco, Inc. of Dallas, Texas. Apparatus for offshore handling and running of a BOP stack. 4,108,318, Cl. 214-1.00R.
Rodel, Gunther Georg, to Bodenseewerk Perkin-Elmer & Co., Gmbh. Circuit for converting a.c. voltage into a d.c. voltage. 4,109,308, Cl. 363-125.000.
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Henkler, Herbert; Deichelmann, Hermann; Koenig, Roland; Koch, Volker; and Roeger, Bernd, 4,109,317, Cl. 365-133.000.
Rogers, Walter Clark, Jr., to Royal Development Company, Inc. Wall-avoiding recliner chair. 4,108,491, Cl. 297-85.000.
Rognon, Armand. Safety group for diesel engines. 4,108,129, Cl. 123-139.0AZ.
Rohm GmbH: *See*—
Grampp, Ekkehard; Schmitt, Reinhold; and Urlaub, Reinhold, 4,109,017, Cl. 426-51.000.
Rohm and Haas Company: *See*—
Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,108,630, Cl. 71-94.000.
Rohr Industries, Incorporated: *See*—
Tantlinger, Keith W., 4,108,488, Cl. 296-84.00R.
Rollmann, Louis Deane; and Valyocsik, Ernest William, to Mobil Oil Corporation. Synthesis of zeolite ZSM-11. 4,108,881, Cl. 260-448.00C.
Rolls-Royce Limited: *See*—
Mawson, Robert James, 4,108,571, Cl. 416-221.000.
Rombach, Joseph Xavier; and Lambert, James Hubert. Golf bag accessory. 4,108,409, Cl. 248-96.000.
Ropchan, George. Teaching aid for mathematics. 4,107,855, Cl. 35-31.00R.
Rosback, Donald H.; and Neuzil, Richard W., to UOP Inc. Process for the separation of ethylbenzene. 4,108,915, Cl. 260-674.0SA.
Rose, Elva Lincoln: *See*—
Clendening, Francis Joseph, Jr.; and Rose, Elva Lincoln, 4,107,828, Cl. 28-254.000.
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Rosenblath, Quinlan T., Jr.: *See*—
Bartley, Thomas S.; and Rosenblath, Quinlan T., Jr., 4,108,574, Cl. 417-19.000.
Rosenblatt, Solomon, to Johnson & Johnson. Method for shaping a plastic membrane. 4,108,938, Cl. 264-127.000.
Ross, Gerald F.: *See*—
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Rossi, Albert; and Miller, Harold N., to Exxon Research & Engineering Co. Derivatized ethylene/polar monomer polymers of improved performance. 4,108,612, Cl. 44-62.000.
Rostek, Paul M.; and Baeyertz, John F., to NCR Corporation. Solderless circuit board component. 4,109,295, Cl. 361-401.000.
Rostek, Paul M.; and Baeyertz, John F., to NCR Corporation. Machine insertable circuit board electronic component. 4,109,296, Cl. 361-401.000.
Roth American, Inc.: *See*—
Tomalinas, William R., Jr.; and Gurbst, Herbert S., 4,108,517, Cl. 312-297.000.
Rothenberg, Peter: *See*—
Niemaszyk, Casimer; and Rothenberg, Peter, 4,108,358, Cl. 235-302.000.
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Bonne, Claude; Perronnet, Jacques; and Teche, Andre, 4,108,993, Cl. 424-248.570.
Buendia, Jean; and Schalbar, Jeanine, 4,109,009, Cl. 424-283.000.
Poittevin, Andre; Derible, Pierre Henri; and Fournex, Robert, 4,108,994, Cl. 424-250.000.
Rouverol, William Spence. Standard-pitch gearing. 4,108,017, Cl. 74-462.000.
Rowe, Charles L.; and Lewis, Ronald A. Disposable thermometer. 4,108,002, Cl. 73-371.000.
Roy, Clarence H. Chromium reduction process. 4,108,770, Cl. 210-50.000.
Roy, Siegfried S.: *See*—
Krishnakumar, Suppayan M.; Roy, Siegfried S.; Pocock, John F. E.; Das, Salil K.; and Mahajan, Gautam K., 4,108,324, Cl. 215-1.00C.
Royal Development Company, Inc.: *See*—
Rogers, Walter Clark, Jr., 4,108,491, Cl. 297-85.000.
Royer, George Ronald, to Bratton, Robert L., a part interest. Multi-net table tennis apparatus. 4,108,434, Cl. 273-30.000.
Rub-A-Venture: *See*—
Kupperman, Sam; and Kupperman, Dennis, 4,107,840, Cl. 30-172.000.
Rubens, Louis C.; and Alexander, Willard E., to Dow Chemical Com-

pany, The. Molding expandable thermoplastic resins. 4,108,934, Cl. 264-53.000.
Rucker, Dugan Allan; Wollermann, Louis Albert; and Krum, Jack Kern, to International Telephone and Telegraph Corporation. Porous yeast leavened dough product. 4,109,023, Cl. 426-549.000.
Rudzki, Eugene M.: *See*—
Burcaw, Kenneth R., Jr; Kwasnoski, Daniel; and Rudzki, Eugene M., 4,108,735, Cl. 203-7.000.
Ruegger, Artur; and Kuhn, Max, to Sandoz Ltd. Dihydrocyclosporin C. 4,108,985, Cl. 424-177.000.
Ruehmann, Donald W.: *See*—
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Ruhl, Gary L.: *See*—
Anderson, Gordon K.; Leuck, Steven M.; and Ruhl, Gary L., 4,108,026, Cl. 81-3.00R.
Rumball, Kenneth Francis, to Airfix Industries Limited. Production of composite containers. 4,108,587, Cl. 425-112.000.
Rupinski, Frederick Alexander: *See*—
Landau, John Vernon, Jr.; and Rupinski, Frederick Alexander, 4,108,090, Cl. 112-121.110.
Ruppert, Jurgen: *See*—
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Ruruitsu, Satoshi: *See*—
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Rust, Jack E.: *See*—
Kacirek, Kenneth J.; and Rust, Jack E., 4,108,319, Cl. 214-6.0BA.
Rutherford, Harry T. Cutter blade guard for mowers. 4,107,907, Cl. 56-320.200.
Ruti Machinery Works Ltd: *See*—
Guttinger, Peter, 4,108,213, Cl. 139-54.000.
Ruti-Te Strake B.V.: *See*—
van Mullekom, Hubert Peter, 4,108,214, Cl. 139-97.000.
Rutledge, Thomas F., to ICI Americas Inc. Oxidative coupling of alkylphenols or 1-naphthols catalyzed by metal complexes of thio-acid compounds. 4,108,908, Cl. 568-730.000.
Ryall, Michael Leslie; and Robertson, James Rennie, to Weir Pumps Limited. Lubricated mechanical seals for pumps. 4,108,569, Cl. 415-112.000.
Ryd, Per-Olof; and Svensson, Sten Gunnar Hugo, to Atlas Copco Aktiebolag. Spraying device. 4,108,382, Cl. 239-271.000.
Ryu, Ji-Yong, to UOP Inc. Oligomerization of olefins. 4,108,920, Cl. 260-683.15B.
S. A. Vandeputte & Cie: *See*—
Bezsilko, Nicolas, 4,108,187, Cl. 133-3.00A.
S&C Electric Company: *See*—
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S.E.D.I.C.: *See*—
Masclet, Jean, 4,108,392, Cl. 242-84.21A.
S. P. Radio A/S: *See*—
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Sabol, James N.: *See*—
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Saeda, Shigeru; and Suzaka, Yukinori, to Showa Denko K.K. Method and device for measurement of environmental stress cracking. 4,107,979, Cl. 73-88.00R.
Saeki, Yukio: *See*—
Nakamura, Nobutaka; Saeki, Yukio; and Nemoto, Shigeru, 4,109,057, Cl. 428-528.000.
Saffin von Corpon, Paul. Mixing tap. 4,108,208, Cl. 137-636.300.
Saglio, Robert: *See*—
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Saito, Hisashi: *See*—
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.
Saito, Naoki: *See*—
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Saito, Takashi, to Saito, Takashi; and Ishiyama, Takashi. Finger tip ornament. 4,107,947, Cl. 63-2.000.
Saizon, Floyd S. Hand-held, electrically operated fish scaler. 4,107,819, Cl. 17-64.000.
Sakai, Toshimatsu: *See*—
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Sakamoto, Eiichi: *See*—
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Sakazume, Kaiichiro; Fujimori, Noboru; Sakamoto, Eiichi; and Ishikawa, Hidehiko, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic materials. 4,108,668, Cl. 96-135.000.
Saliaris, George P., to Unicare Systems, Inc. Cautery device for ophthalmic or the like surgical application. 4,108,181, Cl. 128-303.100.
Salkeld, Richard W., to United Technologies Corporation. Floating heat insulating baffle for directional solidification apparatus utilizing liquid coolant bath. 4,108,236, Cl. 164-338.00R.
Salyers, John C.: *See*—
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,108,261, Cl. 177-120.000.
Salzman, Marilyn F. Collapsible child seats. 4,108,489, Cl. 297-37.000.
Samuels, Peter B.; and Wood, Ernest C. Graft forming device. 4,108,161, Cl. 128-1.00R.
Samuels, Peter B.; and Wood, Ernest C. Cartridge for suture clips. 4,108,306, Cl. 206-339.000.
Sanada, Masakatsu; and Nakada, Masahiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel feed device of an internal combustion engine. 4,108,126, Cl. 123-122.00E.
Sandberg, Nils Arne, to Ingenjorsfirman N A Sandbergs Industrikonstruktioner AB. Method and control system for controlling a suspended implement. 4,108,499, Cl. 302-34.000.
Sandford, Wayne H., Jr.: *See*—
Bates, Albert M.; Sandford, Wayne H., Jr.; and Madera, Anthony J., 4,109,232, Cl. 340-6.00R.
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Grueninger, Erwin, 4,108,812, Cl. 260-24.000.
Ruegger, Artur; and Kuhn, Max, 4,108,985, Cl. 424-177.000.
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Sargent & Greenleaf, Inc.: *See*—
Miller, James Clayton; Proefrock, Paul R.; and Peppard, James P. K., 4,107,965, Cl. 70-52.000.
Sarkary, Homi G., to International Business Machines Corporation. Interconnection of integrated circuit metallization. 4,109,275, Cl. 357-68.000.
Sarti, Vincenzo; Bertone, Antonino; and Rivetti, Enrico, to Fiat Societa per Azioni. Power assisted steering. 4,108,273, Cl. 180-148.000.
Sasaki, Minoru, to Tokyo Shibaura Electric Co., Ltd. Counter output detector circuit. 4,109,141, Cl. 235-92.0CA.
Sasaki, Takashi: *See*—
Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.
Sasshofer, Franz; Gotschy, Friedrich; Krassig, Johannes; and Wimmer, Adalbert, to Chemiefaser Lenzing Aktiengesellschaft. Apparatus for producing synthetic fibers. 4,107,827, Cl. 28-246.000.
Sato, Hajime: *See*—
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Sato, Masataro. Compositions and methods for the treatment of athlete's foot. 4,108,984, Cl. 424-94.000.
Sato, Sei: *See*—
Murase, Kenji; Sato, Sei; Yamaguchi, Hisashi; and Kashiwara, Hirofumi, 4,109,181, Cl. 315-169.0TV.
Sato, Takao; and Sugiyama, Sakae, to Hitachi, Ltd. Control system for boiling-water reactor. 4,108,720, Cl. 176-20.00R.
Satoh, Kenji; and Watanabe, Mitsuru, to Hitachi Heating Appliances Co., Ltd. High frequency energy apparatus having automatic final temperature compensator. 4,109,129, Cl. 219-10.55B.
Satoh, Tsuyoshi; and Tachino, Kenzo, to Mitsubishi Denki Kabushiki Kaisha. Position-indicating signal equipment for elevator. 4,108,282, Cl. 187-29.00R.
Satterthwaite, Dale J., to Electric Power Research Institute, Inc. Vaned anode for high-intensity ionizer stage of electrostatic precipitator. 4,108,615, Cl. 55-2.000.
Sauer, Gerhard: *See*—
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Schaar, Charles, to Colgate-Palmolive Company. Disposable diaper. 4,108,179, Cl. 128-284.000.
Schach, Erich: *See*—
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Estes, Lewis W.; and Johns, Paul W., 4,109,042, Cl. 428-193.000.
Schal, Wilfried, to Dr. Eduard Fresenius Chemisch-pharmazeutische Industrie K.G. Obtaining desired flow rate from roller pump despite varying the hose means. 4,108,575, Cl. 417-53.000.
Schalbar, Jeanine: *See*—
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Schar, Hugo, to Rieter Machine Works Ltd. Method for catching, severing and rethreading a thread and an apparatus for implementing the method. 4,108,388, Cl. 242-18.0DD.
Scheck, Wilson, Sr. Roller skates with hand brakes. 4,108,451, Cl. 280-11.200.
Scheib, William R.; and Shaffer, Ralph M., Jr., to Aetna-Standard Engineering Co. Multiple blade scrap saw for pipe mill. 4,108,032, Cl. 83-106.000.

Scheidweiler, Andreas, to Cerberus AG. Ionization-type fire sensing system. 4,109,240, Cl. 340-629.000.
Schelfaut, Francois Leon: *See—*
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Plum, Hans; Buschhoff, Max; and Cejka, Alena, 4,108,990, Cl. 424-245.000.
Vorbruggen, Helmut; and Niedballa, Ulrich, 4,109,078, Cl. 536-26.000.
Scheuermann, Glen R., to Airco, Inc. Rotatable substrate holder for use in vacuum. 4,108,107, Cl. 118-49.100.
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Schirtzinger, Joseph F., to Sea-Log Corporation. Towing system for cargo containers. 4,108,101, Cl. 114-245.000.
Schladitz, Hermann Johannes, to Schladitz-Whiskers AG. Apparatus for metallizing strips, sheets or the like. 4,108,108, Cl. 118-49.100.
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Schlage, Ernest L., to Schlage Lock Company. Selectively rotatable cylinder for a lock. 4,107,966, Cl. 70-364.00A.
Schlage, Ernest L., to Schlage Lock Company. Tally lock. 4,107,968, Cl. 70-436.000.
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Schlage, Ernest L., 4,107,968, Cl. 70-436.000.
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McMullen, Carl R.; and Schlageter, Gary M., 4,108,188, Cl. 134-57.00R.
Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J. Evaporative refrigeration system. 4,107,940, Cl. 62-121.000.
Schluter, Jurgen, to E. Schluter Fachhandel fur Schweisstechnik. Welding-, cutting-, or heating torch. 4,109,131, Cl. 219-137.620.
Schmid, Walter. Cardiac frequency measuring instrument. 4,108,166, Cl. 128-2.06F.
Schmidt, Manfred; and Luithlen, Heinz, to Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH. Ski brake. 4,108,465, Cl. 280-605.000.
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Schmidt, Rainer: *See—*
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Schmitt, Reinhold: *See—*
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Schneider, Anthony C., to Freezing Equipment Sales, Inc. Anti-foam chamber for screw compressor oil separator. 4,108,618, Cl. 55-178.000.
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Schneidersmann, Ernst-Otto, to DEMAG Aktiengesellschaft. Paddle wheel pick-up. 4,108,496, Cl. 299-45.000.
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Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.
Schoennagel, Hans-Juergen; and Zahner, John C., to Mobil Oil Corporation. Conversion of coal into liquid fuels. 4,108,758, Cl. 208-8.000.
Schoepe, Adolf. Ball cock having vertically adjustable outlet tube. 4,108,202, Cl. 137-436.000.
Scholin, Harold W. Shaft seal. 4,108,447, Cl. 277-153.000.
Scholl, Eugen, to Wilhelm Bott KG. Central locking mechanism. 4,108,516, Cl. 312-216.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Substituted acetonaphthone perfume compositions. 4,108,799, Cl. 252-522.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Process for preparing mixtures of substituted-hexahydro-acetonaphthones. 4,108,899, Cl. 260-586.00C.
Schreiber, William L.: *See—*
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Schreiner, Franz: *See—*
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Schreyer, Kenneth D.; and Hawkins, Harold V., to Columbus McKinnon Corporation. Oblique lay sprocket wheel and chain construction. 4,108,014, Cl. 74-243.00H.
Schroder, Herbert. Device for preparing the cleaning of carpet floors. 4,107,808, Cl. 15-41.00R.
Schroeder, Charles H. Collimating device for X-rays. 4,109,156, Cl. 250-505.000.
Schroter, Herbert; and Stein, Eckehard, to Hoechst Aktiengesellschaft. Apparatus for developing a photosensitive material using a vaporous ammonia-containing developer. 4,109,268, Cl. 354-299.000.
Schubert & Salzer: *See—*
Mahrt, Gunter; and Goldammer, Georg, 4,107,820, Cl. 19-81.000.
Schuelein, Rolf G.; and Friedrich, Rainer, to Leifheit International Guenter Leifheit GmbH. Corner sweeping brush disposed on a floor sweeper. 4,107,809, Cl. 15-42.000.
Schulmerich Carillons, Inc.: *See—*
Baelz, Harry C.; and Cassel, Harrison E., 4,109,119, Cl. 200-38.0BA.
Schultheis, James R., to Timco Engineering, Inc. Self-contained vehicle battery charger. 4,109,193, Cl. 320-2.000.
Schultz, Carl D.: *See—*
Simonton, Robert D.; and Schultz, Carl D., 4,108,417, Cl. 249-81.000.
Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, to Gulf Research & Development Company. Liquid dielectric composition derived from the alkylation product of benzene with ethylene. 4,108,788, Cl. 252-63.000.
Schulz, Thilo: *See—*
Kabilka, Otto; and Schulz, Thilo, 4,108,329, Cl. 220-453.000.
Schulze-Schoelling, Hermann: *See—*
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.
Schumacher, Hans Jurgen: *See—*
Rathje, Uwe; and Schumacher, Hans Jurgen, 4,108,251, Cl. 172-789.000.
Schwachhofer, Ghislain: *See—*
Jay, Pierre; and Schwachhofer, Ghislain, 4,108,789, Cl. 252-64.000.
Schwarz, Gunter. Arrangement for securing a body to a ski. 4,108,454, Cl. 280-11.37E.
Schwarzbich, Jorg. Spring leg with mounting for the front wheels of automobile vehicles. 4,108,469, Cl. 280-668.000.
Schwarze, Werner: *See—*
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,875, Cl. 260-347.800.
Klenk, Herbert; Offermanns, Heribert; and Schwarze, Werner, 4,108,877, Cl. 260-347.800.
Schweisguth, Bernard: *See—*
Cognacq, Jean-Calude; Schweisguth, Bernard; and Teulon, Jean-Marie, 4,109,008, Cl. 424-273.00R.
Schwing, Karl-Heinz: *See—*
Neubeck, Kurt; Schwing, Karl-Heinz; and Klein, Kurt, 4,108,007, Cl. 73-732.000.
Schylander, Eric Christian, to U.S. Philips Corporation. Apparatus for reading a record carrier. 4,109,277, Cl. 358-8.000.
Scientific-Atlanta, Inc.: *See—*
Davis, Glenn A., 4,109,239, Cl. 340-539.000.
Scott Paper Company: *See—*
Christensen, Rolf Edward, 4,109,035, Cl. 427-365.000.
Scott, Walter Norris; and MacArthur, Judy Anne, to Universities Federation for Animal Welfare. Animal euthanasia. 4,107,818, Cl. 17-51.000.
Sea-Log Corporation: *See—*
Schirtzinger, Joseph F., 4,108,101, Cl. 114-245.000.
Sealectro Corporation: *See—*
Evans, David Roger, 4,108,529, Cl. 339-177.00R.
Seaman, Gary G.: *See—*
Keen, Ralph H.; Kimsey, Raymond D.; and Seaman, Gary G., 4,107,838, Cl. 29-628.000.
Searight, Edward F.; and Flanagan, Paul, to Thermo Electron Corporation. Jet impingement heat exchanger. 4,108,242, Cl. 165-164.000.
Seaton, Thomas: *See—*
Bowden, Roy Dennis; and Seaton, Thomas, 4,108,856, Cl. 260-290.0HL.
Sebalj, Renata: *See—*
Melton, Keith Nelson; and Sebalj, Renata, 4,109,125, Cl. 200-268.000.
Sebelik, Robert V.; and Schaefer, Wilfried, to Winchester Chemical Co. Method of clarifying industrial waste water. 4,108,768, Cl. 210-43.000.
Sebesta, Walter C. Floor safe. 4,108,087, Cl. 109-51.000.
Seckel, Peter H.: *See—*
Dick, Franklin; and Seckel, Peter H., 4,108,559, Cl. 401-217.000.
Secor, Fay W.: *See—*
Will, Fritz G.; and Secor, Fay W., 4,109,065, Cl. 429-105.000.
Secretary of State for Defence in Her Britannic Majesty's Government of Great Britain and Northern Ireland, The: *See—*
Shanks, Ian Alexander, 4,109,241, Cl. 340-324.00M.
Sedco, Inc. of Dallas, Texas: *See—*
Rode, Walter F.; and Jones, Bill R., 4,108,318, Cl. 214-1.00R.
Seghezzi, Hans Dieter; Klimesch, Bernhard; and Zsalatz, Reinhold, to Hilti Aktiengesellschaft. Fastening assembly for refractory linings. 4,107,890, Cl. 52-379.000.

Seidel, Michael C.: *See*—
Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,108,630, Cl. 71-94.000.
Seissl, Johannes: *See*—
Franke, Kurt; Seissl, Johannes; and Stuermer, Wilhelm, 4,108,308, Cl. 206-455.000.
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu. Process for preparation of chromatography solid supports comprising a nucleic acid base-epoxy group containing porous gel. 4,108,804, Cl. 521-121.000.
Sekiya, Fukuo; Morokawa, Shigeru; and Nomura, Yasushi, to Citizen Watch Co., Ltd. Electronic timepiece. 4,107,915, Cl. 58-23.00R.
Seko, Maomi; Ogawa, Shinsaku; and Yoshida, Muneo, to Asahi Kasei Kogyo Kabushiki Kaisha. Electrolysis. 4,108,742, Cl. 204-98.000.
Seligmann, Peter Charles, to Aeci Limited. Electrical connection assembly and connectors therefor. 4,108,524, Cl. 339-47.00R.
Seligson, Charles. Circular knitting machine provided with a novel striping box. 4,107,954, Cl. 66-133.000.
Selwitz, Charles M.: *See*—
Schulz, Johann G. D.; Selwitz, Charles M.; and Onopchenko, Anatoli, 4,108,788, Cl. 252-63.000.
Senger, David Joseph: *See*—
Calvert, Michael Arnold; and Senger, David Joseph, 4,108,196, Cl. 137-72.000.
Seveg, S.A.: *See*—
Lambert, Gerard Edouard; and Begis, Roger, 4,108,068, Cl. 101-363.000.
Shaffer, Ralph M., Jr.: *See*—
Scheib, William R.; and Shaffer, Ralph M., Jr., 4,108,032, Cl. 83-106.000.
Shambelan, Robert Charles; and Lindsley, Charles Wesley, to RCA Corporation. Machine for changing the spacing of a plurality of wafers. 4,108,323, Cl. 214-310.000.
Shamlian, Ralph B.: *See*—
Hollingsworth, Ashley J.; and Shamlian, Ralph B., 4,107,996, Cl. 73-300.000.
Shanks, Ian Alexander, to Secretary of State for Defence in Her Britannic Majesty's Government of Great Britain and Northern Ireland, The. Liquid crystal displays. 4,109,241, Cl. 340-324.00M.
Shannon, Robert D.: *See*—
Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., 4,108,679, Cl. 106-307.000.
Sharki, Martin James: *See*—
Phillips, Victor Quin; Griffin, Phil Harmon; and Sharki, Martin James, 4,108,619, Cl. 55-192.000.
Sharp Kabushiki Kaisha: *See*—
Mitsuyama, Akira; Uchiyama, Hiroaki; and Deguchi, Masanobu, 4,108,544, Cl. 355-8.000.
Sharp, Silas S, to Du Pont de Nemours, E. I., and Company. Miticidal mixtures and method utilizing a macrotetrolide compound. 4,109,007, Cl. 424-279.000.
Shaver, J. Lyle, to Allis-Chalmers Corporation. Agitator for an axial flow cylinder. 4,108,150, Cl. 130-27.00H.
Shaw, Stuart Walter Ker, to International Nickel Company, Inc., The. Alloys of nickel, chromium and cobalt. 4,108,647, Cl. 75-171.000.
Sheffler, Robert J.: *See*—
Radice, Michael; and Sheffler, Robert J., 4,108,558, Cl. 401-78.000.
Shell Oil Company: *See*—
Dante, Mark F., 4,108,824, Cl. 260-33.2EP.
Henry, Arthur C., 4,108,897, Cl. 260-570.80R.
Kok, Riekert; and van der Zeeuw, Abraham J., 4,108,958, Cl. 423-24.000.
Pilgram, Kurt H. G., 4,108,399, Cl. 542-417.000.
Wattimena, Freddy, 4,108,917, Cl. 260-677.00R.
Shemer, Michael: *See*—
Creinin, Howard Lee; and Shemer, Michael, 4,108,847, Cl. 260-112.00G.
Shen, Chah M.: *See*—
Loshaek, Samuel; and Shen, Chah M., 4,109,070, Cl. 526-77.000.
Shepherd, Charles Grey; and Yeoman, Brian Donald, to J.A. Wilson Display Limited. Display structure. 4,108,085, Cl. 108-108.000.
Sherritt Gordon Mines Limited: *See*—
Wallace, Herbert F.; and Weir, Donald R., 4,108,640, Cl. 75-103.000.
Sherwood Refractories Inc.: *See*—
Vidmar, Albert J., 4,109,144, Cl. 240-2.00V.
Shibayama, Kunio: *See*—
Manabe, Katsushi; Nakama, Fumio; and Shibayama, Kunio, 4,108,288, Cl. 191-49.000.
Shibayama, Masayoshi; Nakano, Yuji; and Shimizu, Youji, to Taiyo Yuden Co., Ltd. Ceramic capacitor with nickel-solder electrodes. 4,109,292, Cl. 361-321.000.
Shibukawa, Suetaroo, to Hitachi, Ltd. Capactive discharge ignition circuit. 4,108,131, Cl. 123-148.0CC.
Shima, Yoshio; Noda, Shigeo; and Owa, Kaoru, to Toyoda-Koki Kabushiki-Kaisha. Index device for tool storage magazine. 4,109,188, Cl. 318-602.000.
Shimiya, Keiji: *See*—
Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.
Shimizu, Akihiko: *See*—
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,108,804, Cl. 521-121.000.
Shimizu, Isamu: *See*—
Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.
Shimizu, Youji: *See*—
Shibayama, Masayoshi; Nakano, Yuji; and Shimizu, Youji, 4,109,292, Cl. 361-321.000.
Shin-Shirasuna Electric Corp.: *See*—
Katsurayama, Hiromasa; and Hirabayashi, Nobuhiro, 4,109,286, Cl. 360-96.000.
Shine, Thomas R. Method and machine for producing sand molds. 4,108,234, Cl. 164-38.000.
Shinjo, Teruya: *See*—
Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, 4,108,787, Cl. 252-62.560.
Shinoki, Takanori: *See*—
Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.
Shionogi & Co., Ltd.: *See*—
Yoshimura, Masakiyo; and Yamaguti, Yasukazu, 4,108,823, Cl. 260-33.4PQ.
Shioyama, Giichi: *See*—
Minami, Hidehiro; Ikeura, Kenji; and Shioyama, Giichi, 4,107,920, Cl. 60-276.000.
Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, to Nippon Steel Corporation. Continuously cast slabs for producing grain-oriented electrical steel sheets having excellent magnetic properties. 4,108,694, Cl. 148-31.550.
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, to Abbott Laboratories. Antibiotic derivatives of XK-62-2 compounds. 4,109,077, Cl. 536-17.000.
Shiraishi, Yoshihiro: *See*—
Tatani, Atsushi; Omoto, Setsuo; and Shiraishi, Yoshihiro, 4,108,959, Cl. 423-240.000.
Shirane, Naoyuki: *See*—
Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.
Shizuka, Kohei: *See*—
Asano, Shiro; Shizuka, Kohei; Mikami, Junji; Hirakawa, Kenichi; and Matsumura, Mutsuo, 4,108,893, Cl. 260-561.00N.
Shonerd, David E.; and Danze, Carlos, to American Safety Equipment Corporation. Wall-end securement for pressure reservoirs having automatic safety pressure relief. 4,108,327, Cl. 220-3.000.
Shosuke Okamoto: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
Showa Denko K.K.: *See*—
Saeda, Shigeru; and Suzaka, Yukinori, 4,107,979, Cl. 73-88.00R.
Shuff, Thomas J.; and Sims, Robert W., to Monsanto Company. Method and apparatus for level measurement using microwaves. 4,107,993, Cl. 73-290.00R.
Shulsinger, Joseph. Aerosol dispenser with inner container and piston. 4,108,219, Cl. 141-3.000.
Shumway, Durland K.: *See*—
Kenkare, Divaker B.; and Shumway, Durland K., 4,108,977, Cl. 424-46.000.
Shuster, Edward J.: *See*—
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,799, Cl. 252-522.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,899, Cl. 260-586.00C.
Siano, James N.: *See*—
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,799, Cl. 252-522.000.
Schreiber, William L.; Siano, James N.; and Shuster, Edward J., 4,108,899, Cl. 260-586.00C.
Sias, Roy C., to Continental Oil Company. Anti-microbial compositions. 4,109,010, Cl. 424-289.000.
Sick, Erwin; and Staimer, Angelika, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Apparatus for combining light emanating from a linear scanning field. 4,108,533, Cl. 350-6.700.
Siegfried, Armin, to Escher Wyss Limited. Pressure roller. 4,107,831, Cl. 29-116.0AD.
Siejka, Julius: *See*—
Rigo, Serge; and Siejka, Julius, 4,108,736, Cl. 204-1.500.
Siemens Aktiengesellschaft: *See*—
Fleer, Ernst-Otto; and Heubeck, Erich, 4,107,846, Cl. 32-27.000.
Franke, Kurt; Seissl, Johannes; and Stuermer, Wilhelm, 4,108,308, Cl. 206-455.000.
Fries, Paul, 4,108,239, Cl. 165-105.000.
Glasl, Andreas; and Murrmann, Helmuth, 4,109,273, Cl. 357-35.000.
Helder, Johan; De Steur, Hubert; and Pernegger, Wolfgang, 4,108,555, Cl. 356-184.000.
Herbst, Heiner; and Mueller, Ruediger, 4,109,272, Cl. 357-35.000.
Keller, Wolfgang; and Reuschel, Konrad, 4,108,714, Cl. 156-608.000.
Lindstroem, Harry; and Kvaerna, Sverre, 4,108,426, Cl. 269-328.000.
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, 4,109,155, Cl. 250-505.000.
Vachenauer, Erwin; and Mueller, Bernd, 4,109,250, Cl. 343-112.00R.
von Basse, Paul Werner; and Hofmann, Rudiger, 4,109,270, Cl. 357-23.000.
Widmann, Dietrich, 4,108,717, Cl. 156-656.000.
Siesto, Joseph T. Belt holding clips, particularly for keys, tools and the like. 4,107,823, Cl. 24-3.00K.

Sigrist, Paul. Fixation clamp for air pump hose. 4,108,474, Cl. 285-12.000.

Sih, Charles John: *See—*
Woessner, Warren Dexter; Sih, Charles John; Kluender, Harold Clinton; Arndt, Henry Clifford; and Biddlecom, William Gerard, 4,108,892, Cl. 260-514.00D.

Sih, John C., to Upjohn Company, The. Trans,trans-2,3,4,5-tetradehydro-PGI$_1$, compounds. 4,109,082, Cl. 542-426.000.

Silliman, Thomas B. Omnidirectional broadband circularly polarized antenna. 4,109,255, Cl. 343-853.000.

Silva, John C., Jr. Amplified cycle steering system. 4,108,460, Cl. 280-236.000.

Silverstein, Emanuel, to Research Corporation. Sarcoidosis test. 4,108,726, Cl. 195-103.50R.

Simmons, James. Mobile broiler rotisserie apparatus. 4,108,055, Cl. 99-421.00H.

Simms, Paul C.: *See—*
Rickey, Frank A., Jr.; Simms, Paul C.; and Butler, Neal R., 4,108,718, Cl. 159-30.000.

Simone, Andre A.: *See—*
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, 4,108,798, Cl. 252-502.000.

Simonton, Robert D.; and Schultz, Carl D., to Dale Products, Inc. Battery post and connector strap mold. 4,108,417, Cl. 249-81.000.

Simplimatic Engineering Co.: *See—*
Bowser, Robert E., 4,108,061, Cl. 100-7.000.

Simpson, Robert O., to Goodyear Tire & Rubber Company, The. Shield for sealing a tubeless tire on a spoked wheel rim. 4,108,232, Cl. 152-365.000.

Sims, Robert W.: *See—*
Shuff, Thomas J.; and Sims, Robert W., 4,107,993, Cl. 73-290.00R.

Singer Company, The: *See—*
Ciecior, Heinrich, 4,108,096, Cl. 112-221.000.
Hestily, Charles Edward, 4,108,225, Cl. 144-134.00D.
Landau, John Vernon, Jr.; and Rupinski, Frederick Alexander, 4,108,090, Cl. 112-121.110.

Singh, Baldev: *See—*
Lesher, George Y.; and Singh, Baldev, 4,109,092, Cl. 544-328.000.

Singrey, Raymond Edward: *See—*
Venetta, Henry John; Singrey, Raymond Edward; and Coughlin, John Edward, 4,108,594, Cl. 432-24.000.

Sitter, Spencer B., to Taylor, Jay. Solar-heated stock tank. 4,108,156, Cl. 126-271.000.

Sizer, Phillip S., to Otis Engineering Corporation. Apparatus for controlling a well during drilling operations. 4,108,257, Cl. 175-230.000.

Sjoholm, Claes Bertil; and Martensson, Karl J. G., to Alfa-Laval AB. Cheese-making apparatus. 4,108,058, Cl. 99-466.000.

Skarzynski, Thaddeus S.; and Swisher, James A., to C. Cowles & Company. Meter box guard lock. 4,107,959, Cl. 70-159.000.

SKF Kugellagerfabriken GmbH: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,503, Cl. 308-6.00C.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,504, Cl. 308-6.00C.

Skrzipek, Jurgen; and Reuter, Helge, to Triumph Werke Nurnberg A.G. Error correcting typewriter. 4,108,557, Cl. 400-697.100.

Skubal, John J., to Atwood Vacuum Machine Company. Gas spring. 4,108,423, Cl. 267-64.00R.

Slater, Norman S., to Norman Slater, Inc. Interconnectible structural tubular members. 4,108,316, Cl. 211-199.000.

Slaughter, Harold W. Safety device for bicycle. 4,108,535, Cl. 350-99.000.

Slaymaker, Frank H. Method of and apparatus for electronically generating musical tones and the like. 4,108,036, Cl. 84-1.010.

Slivenko, Victor; and Emken, Michael R., to General Atomic Company. Blood access device. 4,108,173, Cl. 128-214.00R.

Slivenko, Victor, to General Atomic Company. Catheter interlock system. 4,108,174, Cl. 128-214.00R.

Sloan, James L.; and Meeker, Greg W., to Cross River Products, Inc. Swivel assembly. 4,107,817, Cl. 16-20.000.

Smejkal, Paul V.; and Baranski, Robert B., to Gulf & Western Manufacturing Company. Press drive mechanism. 4,107,973, Cl. 72-450.000.

Smith, Bruce N., to Spherex, Inc. Hub cap. 4,108,497, Cl. 301-37.0SA.

Smith, Craig R. Well drilling apparatus. 4,108,255, Cl. 175-9.000.

Smith, Harvey A.: *See—*
Jowett, Terence W.; and Smith, Harvey A., 4,108,008, Cl. 73-756.000.

Smith International, Inc.: *See—*
Dixon, Robert L.; and Maxsted, Malcolm D., 4,108,259, Cl. 175-344.000.
Quinlan, John R., 4,108,692, Cl. 148-12.300.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corp. Urea composition for forming thermoparticulating coating. 4,108,001, Cl. 73-339.00R.

Smith, John Lionel, to Andrew Hydraulics International Limited. Device for crimping tubular elements. 4,107,964, Cl. 72-36.000.

Smith, Kenneth R., to Mallinckrodt, Inc. 1-(3,5-Disubstituted-2,4,6-triiodophenyl)-3-(polyhydroxy-alkyl)urea compounds. 4,109,081, Cl. 536-53.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,109,003, Cl. 424-273.00R.

Smith, Peter: *See—*
Baird, David Boyd; Costello, Alan Thomas; Fishwick, Brian Ribbons; McClelland, Robert David; and Smith, Peter, 4,108,867, Cl. 260-332.20C.

Smith, Richard Grant: *See—*
Brackett, Charles Arthur; and Smith, Richard Grant, 4,109,217, Cl. 331-94.50S.

Smith, William N.: *See—*
Bauer, Werner R.; and Smith, William N., 4,109,121, Cl. 200-67.00E.

SmithKline Corporation: *See—*
Gleason, John G.; Holden, Kenneth G.; and Yim, Nelson C. F., 4,108,854, Cl. 260-252.000.
Holden, Kenneth George, 4,108,989, Cl. 424-244.000.

Snaper, Alvin A., to Advanced Patent Technology, Incorporated. Alloy sensor. 4,107,997, Cl. 73-304.00R.

Snelgrove, William Richard Noble: *See—*
Lake, Malcolm John; and Snelgrove, William Richard Noble, 4,108,639, Cl. 75-101.00R.

Snyder, Jan S., to Xerox Corporation. Method and apparatus for inverting the polarity of an input image formed on a surface of an image recording device. 4,109,316, Cl. 365-127.000.

Snyder, John R., to Jet Aeration Company. Acoustical apparatus. 4,108,274, Cl. 181-229.000.

Snyder, Kenneth J.: *See—*
Lawson, Michael B.; and Snyder, Kenneth J., 4,108,681, Cl. 134-20.000.

Societe Anonyme de Telecommunications: *See—*
Molleron, Claude Auguste, 4,109,109, Cl. 179-15.0BY.

Societe Anonyme Francaise du Ferodo: *See—*
de Gennes, Gerard, 4,108,295, Cl. 192-111.00A.
de Gennes, Gerard, 4,108,699, Cl. 156-92.000.

Societe de Diffusion Neiman: *See—*
Neiman, Michel, 4,107,960, Cl. 248-165.000.

Societe d'Etudes et de Realisations Electroniques: *See—*
Weber, Claude Edmond Georges, 4,108,551, Cl. 356-4.000.

Societe Nationale des Petroles d'Aquitaine: *See—*
Tramier, Bernard; Delourme, Raymond; and Fresnel, Philippe, 4,108,866, Cl. 260-329.00R.

Societe Nationale Elf Aquitaine: *See—*
Bernat, Jean-Pierre; and Sors, Jean, 4,108,744, Cl. 204-119.000.

Soder, Alfons: *See—*
Mohler, Werner; Jayme, Manfred; Hinze, Heinz-Joachim; Komarek, Jaromir; Reiser, Mario; and Soder, Alfons, 4,108,995, Cl. 424-253.000.

Sofinowski, Jacob, III, to AAI Corporation. Cartridge magazine. 4,107,862, Cl. 42-50.000.

Sogo, Masaaki, to Sanko Air Plant Ltd. Level detector. 4,107,994, Cl. 73-290.00V.

Sokolowski, Daniel E., to United States of America, National Aeronautics and Space Administration. Heat exchanger. 4,107,919, Cl. 165-169.000.

Sollich, Helmut, to Sollich KG. Method of and apparatus for cooling a cooked confectionery. 4,107,938, Cl. 62-71.000.

Sollich KG: *See—*
Sollich, Helmut, 4,107,938, Cl. 62-71.000.

Soltanoff, Louis: *See—*
Bateman, Coates F.; and Soltanoff, Louis, 4,107,992, Cl. 73-260.000.

Solvay & Cie.: *See—*
Berger, Eugene; and Bienfait, Charles, 4,109,071, Cl. 526-114.000.
Godfroid, Marcel; and Gerkens, Roger, 4,108,910, Cl. 260-652.50R.

Sommer, Helmut: *See—*
Hinman, Wilbur S., Jr.; Sommer, Helmut; and Tozzi, Louis M., 4,108,075, Cl. 102-214.000.

Sommer, Thomas R., to National Controls, Inc. Load cell. 4,107,985, Cl. 73-141.00A.

Sonex International Corp.: *See—*
Mendrala, James A.; and Peterson, Harold L., 4,109,278, Cl. 358-22.000.

Sony Corporation: *See—*
Takizawa, Kazuyuki, 4,108,444, Cl. 274-9.00R.
Takizawa, Kazuyuki, 4,108,445, Cl. 274-9.00R.
Yamamoto, Harunori, 4,109,115, Cl. 179-100.110.

Sorokina, Klavdia Pavlovna: *See—*
Zhurkina, Galina Vasilievna; Moskalenko, Galina Evseevna; Khimushin, Fedor Fedorovich; Lashko, Nikolai Fedorovich; Sorokina, Klavdia Pavlovna; Grebtsova, Tamara Mikhailovna; and Kontsevaya, Evgenia Markovna, 4,108,648, Cl. 75-171.000.

Sors, Jean: *See—*
Bernat, Jean-Pierre; and Sors, Jean, 4,108,744, Cl. 204-119.000.

Sottosanti, Philip C.; Baker, William H.; and Dolling, William T., to Thiokol Corporation. Rocket nozzle bearing seal. 4,108,381, Cl. 239-265.350.

Spann, Donald C. Patient support strap. 4,108,170, Cl. 128-134.000.

Sparkler Filters, Inc.: *See—*
Kracklauer, Aloysius C., 4,108,158, Cl. 126-271.000.

Spaziante, Placido M.: *See—*
de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., 4,108,756, Cl. 204-286.000.

Spectroderm International: *See—*
Brandt, J. Wayne, 4,109,319, Cl. 366-219.000.

Sperry Rand Corporation: *See—*
Minden, Henry Thomas; and Premo, Richard W., 4,109,135, Cl. 219-216.000.
Robbins, Kenneth W.; and Ross, Gerald F., 4,107,987, Cl. 73-151.000.

Spherex, Inc.: *See—*
Smith, Bruce N., 4,108,497, Cl. 301-37.0SA.

Spinner, Ernest Elliott; Miller, Lowell Donald; Riely, Phyllis Eleanor; Avery, Carl Fredrick, Jr.; Hounsell, Melvin Wayne; and Howard, Ben Bruce, to Marion Laboratories, Inc. Anaerobic liquid transport apparatus. 4,108,728, Cl. 195-127.000.

Spino, Raymond N.; and Warren, Casimir G. Orthodontic appliance. 4,107,843, Cl. 32-14.00E.

Spiral Step Tool Company: *See—*
Breitenstein, Charles Thomas, 4,107,882, Cl. 51-118.000.

Spitzer, Richard: *See—*
Schneider, Stanley; and Spitzer, Richard, 4,109,218, Cl. 332-7.510.

Spoerke, Roger W.; and Frech, Kenneth J., to Goodyear Tire & Rubber Company, The. Dehydrogenation process. 4,108,913, Cl. 260-669.00R.

Spohn, Larry L. Sleeper storage bins. 4,108,487, Cl. 296-28.00C.

Spoonamore, John Gilbert: *See—*
Unger, Ronald James; and Spoonamore, John Gilbert, 4,107,984, Cl. 73-113.000.

Spragg, Martin Alfred, Jr. Modular record selector and storage apparatus. 4,108,511, Cl. 312-9.000.

Sprague Electric Company: *See—*
Kolkowski, James J., 4,107,834, Cl. 29-570.000.

Sprague, Peter W., to E. R. Squibb & Sons, Inc. Amidines. 4,108,894, Cl. 260-564.00R.

Spratt, Eugene M.; and Dominguez, Robert C. Portable, collapsible hoisting and supporting apparatus. 4,108,411, Cl. 248-165.000.

Spribag Aktiengesellschaft: *See—*
Egli, Ernst, 4,108,384, Cl. 239-665.000.

Spuhler, Heinrich, to Aktiengesellschaft Fr.Mettler's Sohne, Maschinenfabrik. Method and apparatus for manufacturing a spun yarn from one or several filaments. 4,107,908, Cl. 57-1.00R.

Sragal, Richard F. Constant tension apparatus for flexible endless drive means. 4,108,013, Cl. 74-242.11C.

SRI International: *See—*
Henry, David W.; and Tong, George L., 4,109,076, Cl. 536-4.000.

Sryniawski, Joseph F.: *See—*
Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., 4,108,679, Cl. 106-307.000.

Stadler, Robert L.: *See—*
Falk, Leonard P.; Stadler, Robert L.; and Alford, James R., 4,108,333, Cl. 221-13.000.

Stahlecker, Fritz; and Stahlecker, Hans. Mobile piecing device and method for an open end spinning machine. 4,107,957, Cl. 57-34.00R.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 4,107,957, Cl. 57-34.00R.

Stahlwerke Peine-Salzgitter A.G.: *See—*
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.

Staimer, Angelika: *See—*
Sick, Erwin; and Staimer, Angelika, 4,108,533, Cl. 350-6.700.

Stamer, Walter, to Claudius Peters AG and Maxpeters Gesellschaft fuer Verfahrenstechnik mbH. Process and equipment for effecting savings in compressed gases during injection of solids by means of pneumatic conveyors. 4,108,500, Cl. 302-53.000.

Stamicarbon, B.V.: *See—*
de Cooker, Mario G. R. T.; and Hermus, Antonius J. M., 4,109,089, Cl. 544-192.000.
van Hardeveld, Rudolf; and Hendriks, Petrus F.A.M., 4,109,090, Cl. 544-201.000.

Standard Oil Company, The: *See—*
Li, George S., 4,109,073, Cl. 526-280.000.

Standard Oil Company a corporation of Indiana: *See—*
Fields, Ellis K., 4,108,864, Cl. 260-326.00C.

Standard Oil Company (Indiana): *See—*
Jones, Loyd W., 4,108,246, Cl. 166-312.000.

Standiford, Fred W. On-press printing plate locking system. 4,108,069, Cl. 101-415.100.

Stanley, John H., to Goodyear Tire & Rubber Company, The. Method for making hose incorporating an embedded static ground conductor. 4,108,701, Cl. 156-160.000.

Stant Manufacturing Company, Inc.: *See—*
Evans, John H., 4,107,961, Cl. 70-165.000.

Starks, Charles M.: *See—*
Leach, Bruce Eugene; and Starks, Charles M., 4,108,909, Cl. 568-766.000.

Stauffer Chemical Company: *See—*
Coll-Palagos, Miguel; and Surridge, James H., 4,108,599, Cl. 8-137.000.
Fancher, Llewellyn W., 4,108,988, Cl. 424-211.000.
Lauck, Robert M., 4,109,025, Cl. 426-551.000.

Stearns-Roger Corporation: *See—*
Jennings, Eugene W., 4,108,485, Cl. 294-67.0BC.

Steiger, Roger A.; and Stroke, Frederick G., to PPG Industries, Inc. Porous refractory metal boride article having dense matrix. 4,108,670, Cl. 106-40.00R.

Steimann, Franz, to Didier Engineering GmbH. Door of the self-locking type. 4,107,879, Cl. 49-465.000.

Stein, Eckehard: *See—*
Schroter, Herbert; and Stein, Eckehard, 4,109,268, Cl. 354-299.000.

Stein, Volkhard: *See—*
Stumpp, Gerhard; Wessel, Wolf; Stein, Volkhard; and Ripper, Wolfgang, 4,108,117, Cl. 123-33.00A.

Steinberg, Walter A.; and Parker, Howard E., to Autonumerics, Inc. Contour control system including cutter radius compensation. 4,109,187, Cl. 318-572.000.

Stemler, Orrin A.: *See—*
Kelley, James E.; and Stemler, Orrin A., 4,108,561, Cl. 403-166.000.

Stemme, Otto; Lermann, Peter; and Winkler, Alfred, to Agfa-Gevaert AG. Motion-picture camera for cassette-loaded film. 4,108,542, Cl. 352-72.000.

Stemmle, Denis J., to Xerox Corporation. Document loading for copying. 4,108,547, Cl. 355-50.000.

Stephens, William D.: *See—*
Ashmore, Charles I.; Combs, Charles S., Jr.; and Stephens, William D., 4,108,696, Cl. 149-19.200.

Sterling Drug Inc.: *See—*
Albertson, Noel F., 4,108,857, Cl. 260-293.540.
Barr, James W., Jr., 4,108,680, Cl. 134-3.000.
Lesher, George Y.; and Singh, Baldev, 4,109,092, Cl. 544-328.000.

Sterner, Charles J.: *See—*
Kwasnoski, Daniel; Sterner, Charles J.; Horst, Russel J.; and Burcaw, Kenneth R., Jr., 4,108,734, Cl. 203-7.000.

Stevens, Roger Charles: *See—*
Stewart, John; and Stevens, Roger Charles, 4,108,294, Cl. 192-85.00R.

Stewart, John; and Stevens, Roger Charles, to Twiflex Couplings Limited. Rotary fluid couplings. 4,108,294, Cl. 192-85.00R.

Stewart-Warner Corporation: *See—*
Taylor, Kenneth James, 4,107,998, Cl. 73-313.000.

Steyert, William A., Jr., to United States of America, Energy. High temperature refrigerator. 4,107,935, Cl. 62-3.000.

Stine, Clifton E.; Chartier, Woodrow D., Jr.; and Caponegro, Mike A., to United States of America, Navy. Aircraft head-up display unit mount adjustment tool. 4,108,025, Cl. 81-3.00R.

Stine, Laurence O.: *See—*
Hemler, Charles L.; and Stine, Laurence O., 4,108,795, Cl. 252-419.000.

Stiso, Sisto Nicholas; and Sutula, Chester L., to Miles Laboratories, Inc. Method, composition and device for determining the specific gravity or osmolality of a liquid. 4,108,727, Cl. 195-103.50R.

Stockdale, George Fairbank: *See—*
Cosentino, Louis Salvatore; Endriz, John Guiry; and Stockdale, George Fairbank, 4,109,299, Cl. 361-412.000.

Stone Container Corporation: *See—*
Partain, James H., 4,108,348, Cl. 229-15.000.

Storey, Leo Martin, Jr.: *See—*
Aldridge, Clarence Foster; Storey, Leo Martin, Jr.; and Cilurzo, Joseph William, 4,108,310, Cl. 206-570.000.

Stover, Dennis E., to Atlantic Richfield Company. Method for the restoration of an underground reservoir. 4,108,722, Cl. 195-1.000.

Stowell, Michael James; and Watts, Brian Michael, to T.I. (Group Services) Limited. Aluminium base alloys. 4,108,691, Cl. 148-11.50A.

Strangman, Thomas E.: *See—*
Beale, Harry A.; Strangman, Thomas E.; and Taylor, Edward W., 4,109,061, Cl. 428-678.000.

Straub, Immanuel. Pipe coupling. 4,108,479, Cl. 285-112.000.

Strayer Coin Bag Company, Inc.: *See—*
Bonner, Cletus D., 4,108,227, Cl. 150-15.000.

Strike Corporation, The: *See—*
Payet, George L., 4,108,598, Cl. 8-115.700.

Stritzinger, Heinz: *See—*
Hammon, Fritz; Ohlinger, Manfred; Grosselfinger, Horst; Stritzinger, Heinz; Hartmann, Job-Werner; Schoenafinger, Eduard; and Schneider, Walter, 4,109,046, Cl. 428-216.000.

Stroezel, Reinhold, to Robert Bosch GmbH. Power driver for threaded fasteners. 4,108,252, Cl. 173-12.000.

Stroke, Frederick G.: *See—*
Steiger, Roger A.; and Stroke, Frederick G., 4,108,670, Cl. 106-40.00R.

Struth, Wolfgang Ferdinand: *See—*
Trinks, Walter Louis Adolf; and Struth, Wolfgang Ferdinand, 4,108,072, Cl. 102-52.000.

Stubenvoll, Alfred: *See—*
Peter, Wolfgang; Koch, Heinz; and Stubenvoll, Alfred, 4,108,689, Cl. 148-6.15R.

Stuermer, Wilhelm: *See—*
Franke, Kurt; Seisal, Johannes; and Stuermer, Wilhelm, 4,108,308, Cl. 206-455.000.

Stumpp, Gerhard; Wessel, Wolf; Stein, Volkhard; and Ripper, Wolfgang, to Robert Bosch GmbH. Fuel metering system. 4,108,117, Cl. 123-33.00A.

Stupak, Leonid Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.

Sturdevant, Robert D.: *See—*
Gennone, Richard J.; and Sturdevant, Robert D., 4,108,646, Cl. 75-148.000.

Sturman, Oded E.; and Grill, Benjamin, to Burwell, Clifton J. Pilot operated valve. 4,108,419, Cl. 251-30.000.

Sturwold, Robert Joseph, to Emery Industries, Inc. Blends of mineral oil and modified triglycerides useful for metal working. 4,108,785, Cl. 252-56.00R.

Stutt, Charles A.: *See—*
Kincaid, Thomas G.; and Stutt, Charles A., 4,109,204, Cl. 325-38.00R.

Suga, Yozo: *See*—
Shiozaki, Morio; Suga, Yozo; Fujii, Hiromu; and Fujiwara, Kohichi, 4,108,694, Cl. 148-31.550.
Suggs, Charles W. Leaf defoliator assembly for an automatic tabacco harvester. 4,107,902, Cl. 56-27.500.
Sugi, Shohzaburo: *See*—
Takemura, Toshisade; Sugi, Shohzaburo; Nagata, Kenji; and Yahagi, Ryohhei, 4,108,912, Cl. 260-667.000.
Sugimoto, Osamu: *See*—
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,108,296, Cl. 194-99.000.
Sugita, Isao: *See*—
Kimura, Kazuo; Hirano, Masao; Sugita, Isao; and Fujita, Ryuzo, 4,108,947, Cl. 260-889.000.
Sugiyama, Sakae: *See*—
Sato, Takao; and Sugiyama, Sakae, 4,108,720, Cl. 176-20.00R.
Sullivan, Matthew A., to Sullivan Products, Inc. Motor mount for use in model airplane. 4,108,401, Cl. 244-54.000.
Sullivan Products, Inc.: *See*—
Sullivan, Matthew A., 4,108,401, Cl. 244-54.000.
Sulzer Brothers Ltd.: *See*—
Zabelka, Jaroslav, 4,109,137, Cl. 219-285.000.
Sumino, Yasuhiro: *See*—
Nara, Kiyoshi; Sumino, Yasuhiro; Asai, Mitsuko; and Akiyama, Shunichi, 4,108,724, Cl. 195-96.000.
Sumitomo Chemical Company, Limited: *See*—
Akagane, Katsuo; Adachi, Teruho; and Kamio, Kunimasa, 4,108,924, Cl. 260-837.0PV.
Hirohara, Hideo; Nabeshima, Shigeyasu; and Nagase, Tsuneyuki, 4,108,723, Cl. 195-2.000.
Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, 4,108,819, Cl. 260-29.6NR.
Sumitomo Durez Company, Ltd.: *See*—
Nakamura, Nobutaka; Saeki, Yukio; and Nemoto, Shigeru, 4,109,057, Cl. 428-528.000.
Sumitomo Metal Industries, Ltd.: *See*—
Okabe, Hiroshi; Hase, Noboru; Asai, Hitoshi; and Hiramatu, Teruo, 4,107,969, Cl. 72-148.000.
Sumitomo Metal Mining Company Limited: *See*—
Nakabe, Sanai, 4,108,638, Cl. 75-63.000.
Sun Electric Corporation: *See*—
Trussell, Gerald C.; and Arnston, Robert W., 4,108,362, Cl. 235-375.000.
Suntech, Inc.: *See*—
Hansel, William B., 4,108,223, Cl. 141-392.000.
Surridge, James H.: *See*—
Coll-Palagos, Miguel; and Surridge, James H., 4,108,599, Cl. 8-137.000.
Susumu, Iida. Record controlled mechanical store. 4,108,363, Cl. 235-383.000.
Sutula, Chester L.: *See*—
Stiso, Sisto Nicholas; and Sutula, Chester L., 4,108,727, Cl. 195-103.50R.
Suwa, Seiichi: *See*—
Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, 4,108,777, Cl. 210-225.000.
Suzaka, Yukinori: *See*—
Saeda, Shigeru; and Suzaka, Yukinori, 4,107,979, Cl. 73-88.00R.
Suzuka, Osamu: *See*—
Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.
Suzuki, Yujiro: *See*—
Aoki, Yuji; Shimiya, Keiji; Miura, Norio; Mori, Etsuo; and Suzuki, Yujiro, 4,109,152, Cl. 250-486.000.
Svenska Utvecklingsaktiebolaget (SU) Swedish National Development Co.: *See*—
Andersson, Bo Eric Christer; Carlsson, Lars Ivar; and Johnsson, Rolf Christer Roland, 4,109,060, Cl. 425-566.000.
Svensson, Lars-Goran: *See*—
Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.
Svensson, Percy: *See*—
Goransson, Rolf Erik; Eriksson, Gosta Harald; Kalvenes, Oystein; and Svensson, Percy, 4,108,933, Cl. 264-42.000.
Svensson, Sten Gunnar Hugo: *See*—
Ryd, Per-Olof; and Svensson, Sten Gunnar Hugo, 4,108,382, Cl. 239-271.000.
Svoboda, Josef: *See*—
Weigl, Erwin; and Svoboda, Josef, 4,108,466, Cl. 280-605.000.
Swan, Jack C., Jr., to Hanson Industries Inc. Method of producing a viscous flowable pressure-compensating fitting composition from hollow thermoplastic microblends with the use of high frequency heating and dispensing the composition into a sealable, flexible, protective enclosure means. 4,108,928, Cl. 264-26.000.
Swisher, James A.: *See*—
Skarzynski, Thaddeus S.; and Swisher, James A., 4,107,959, Cl. 70-159.000.
Sybron Corporation: *See*—
Aldridge, Clarence Foster; Storey, Leo Martin, Jr.; and Cilurzo, Joseph William, 4,108,310, Cl. 206-570.000.
Sylverst, Leroy M. Sea terminal. 4,107,803, Cl. 9-8.00P.
Systems Concept, Inc.: *See*—
Ray, Orlando F.; and Gutierrez, Enrique H., 4,107,886, Cl. 52-79.110.
Systems & Technic S.A.: *See*—
McMillian, Lonnie S.; and Culp, Harold G., 4,109,139, Cl. 235-92.0CN.
Szasz, Kalman: *See*—
Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.
Szczepanik, Michael F.; Sryniawski, Joseph F.; Busseman, Adolph; and Shannon, Robert D., to Ebonex Corporation. Pigment composition containing elemental carbon and process of making the same. 4,108,679, Cl. 106-307.000.
Sze, Morgan C.; Gelbein, Abraham P.; and Kwon, Joon T., to Lummus Company, The. Denitrification of carbonaceous feedstocks. 4,108,761, Cl. 208-254.00H.
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; and Hase, Yoshihiko, to Lummus Company, The; and Maruzen Petrochemical Co., Ltd. Process for the production of petroleum coke. 4,108,798, Cl. 252-502.000.
Szporny, Laszlo: *See*—
Lorincz, Csaba; Bolyos, Maria; Szasz, Kalman; Szporny, Laszlo; Karpati, Egon; and Palosi, Eva, 4,108,996, Cl. 424-256.000.
Szuhaj, Bernard F.; and Yaste, Joseph R., to Central Soya Company, Inc. Release agent and method. 4,108,678, Cl. 106-243.000.
T.A. Pelsue Company: *See*—
Pelsue, Bradley A.; and Beavers, Allan E., 4,108,143, Cl. 126-110.00B.
T.I. (Group Services) Limited: *See*—
Stowell, Michael James; and Watts, Brian Michael, 4,108,691, Cl. 148-11.50A.
Tachibana, Yoshishige, to Toyo Boseki Kabushiki Kaisha. Loop length correction of spirally set textile fabric in processing apparatus. 4,107,801, Cl. 8-152.000.
Tachikawa, Shiro: *See*—
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
Tachikawa Spring Co., Ltd.: *See*—
Urai, Muneharu; Goto, Shuichi; and Fukui, Yutaka, 4,107,829, Cl. 29-91.100.
Tachino, Kenzo: *See*—
Satoh, Tsuyoshi; and Tachino, Kenzo, 4,108,282, Cl. 187-29.00R.
Tadokoro, Eiichi; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Plating method for memory elements. 4,108,739, Cl. 204-40.000.
Tagashira, Yoshimi: *See*—
Yoshida, Yasuharu; and Tagashira, Yoshimi, 4,109,102, Cl. 178-69.100.
Taira, Yoshito: *See*—
Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, 4,108,819, Cl. 260-29.6NR.
Taiyo Yuden Co., Ltd.: *See*—
Shibayama, Masayoshi; Nakano, Yuji; and Shimizu, Youji, 4,109,292, Cl. 361-321.000.
Takacs, Istvan; Fabry, Gyorgy; Pap, Laszlo; and Kiszely, Gyorgy, to Richter Gedeon Vegyeszeti Gyar Rt. Method of and apparatus for fluidization. 4,107,851, Cl. 34-10.000.
Takahashi, Kozo: *See*—
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.
Takakusagi, Tunehiko: *See*—
Goto, Masuo; Isono, Akira; Takakusagi, Tunehiko; Araki, Masanobu; Ishikawa, Haruo; and Yamaguchi, Yukio, 4,109,160, Cl. 290-52.000.
Takano, Hazime. Clutch apparatus. 4,108,292, Cl. 192-11.000.
Takara Shuzo Co., Ltd.: *See*—
Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, 4,109,000, Cl. 424-263.000.
Takashima, Hisashi: *See*—
Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, 4,108,675, Cl. 106-56.000.
Takayama, Hiroshi; and Aizawa, Tatsuo, to Mita Industrial Company Ltd. Magnetic dry developer for electrostatic photography and process for preparation thereof. 4,108,786, Cl. 252-62.10P.
Takeda Chemical Industries, Ltd.: *See*—
Moriya, Koji; and Furuoya, Itsuo, 4,108,874, Cl. 260-346.750.
Nara, Kiyoshi; Sumino, Yasuhiro; Asai, Mitsuko; and Akiyama, Shunichi, 4,108,724, Cl. 195-96.000.
Takeda, Hiroo; Kanda, Takeshi; Oguchi, Yutaka; and Asano, Naomasa, to Nippon Oil Company Ltd. Process for fluidized contact. 4,108,682, Cl. 134-25.00R.
Takemura, Toshisade; Sugi, Shohzaburo; Nagata, Kenji; and Yahagi, Ryohhei, to Idemitsu Petrochemical Co., Ltd. Two-stage hydrogenation of benzene to form cyclohexane using nickel catalyst. 4,108,912, Cl. 260-667.000.
Takenoya, Hideaki: *See*—
Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, 4,108,093, Cl. 112-158.00E.
Takeuchi, Shoichi: *See*—
Odawara, Kenji; and Takeuchi, Shoichi, 4,108,818, Cl. 260-29.6AQ.
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., to J. M.

Huber Corporation. Method of agglomerating powders. 4,108,932, Cl. 264-37.000.

Takizawa, Hidemitu: *See—*
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.

Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. 4,108,444, Cl. 274-9.00R.

Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. 4,108,445, Cl. 274-9.00R.

Takizawa, Masayoshi: *See—*
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,108,296, Cl. 194-99.000.

Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, to Nikki-Universal Co., Ltd. Method of manufacture of spherical alumina particles. 4,108,971, Cl. 423-428.000.

Talley, Herbert Joseph. Paint spray tip retaining and cleaning adapter. 4,108,379, Cl. 239-119.000.

Tamai, Yasuo: *See—*
Masaki, Kouichi; Shinjo, Teruya; Tamai, Yasuo; and Kitamoto, Tatsuji, 4,108,787, Cl. 252-62.560.

Tamao, Yoshikuno: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.

Tamura, Masayuki: *See—*
Hayashi, Yukichi; Tamura, Masayuki; Sugimoto, Osamu; Takizawa, Masayoshi; and Nishioka, Tatsujiro, 4,108,296, Cl. 194-99.000.

Tanabe, Osamu; Obayashi, Akiro; Nakamura, Teruya; Suzuka, Osamu; Murayama, Masao; and Murai, Hiromu, to Nippon Shinyaku Co., Ltd.; and Takara Shuzo Co., Ltd. 5-Benzylpicolinic acid derivatives. 4,109,000, Cl. 424-263.000.

Tanaka, Akio; Edamura, Mizuo; Ruruitsu, Satoshi; and Kunise, Satoru, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for ion-nitriding. 4,109,157, Cl. 250-531.000.

Tanaka, Hitoshi, to Fuji Photo Optical Co., Ltd. Articulated, four-way bendable tube structure. 4,108,211, Cl. 138-120.000.

Tanaka, Mitsugu; Okazaki, Masaki; Aono, Toshiaki; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Photographic developing agents, process for developing using same, and light-sensitive materials containing same. 4,108,663, Cl. 96-74.000.

Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, to Fujitsu Limited; and Japan Racing Association, The. Apparatus for processing betting tickets. 4,108,364, Cl. 235-419.000.

Tanaka, Toshiro: *See—*
Minowa, Seigi; Toyoshima, Yasuo; Yasuda, Nozomi; and Tanaka, Toshiro, 4,108,879, Cl. 260-405.600.

Tanaka, Yujiro, to Kabushiki Kaisha Komatsu Seisakusho. Cable take-up device for electric drive vehicle. 4,108,264, Cl. 180-2.00R.

Tanigawa, Koichi: *See—*
Kuge, Tsukasa; and Tanigawa, Koichi, 4,109,289, Cl. 361-230.000.

Tanino, Hideo: *See—*
Kishi, Yoshito; Nakatsuka, Shinichi; and Tanino, Hideo, 4,108,861, Cl. 260-306.70C.

Tantlinger, Keith W., to Rohr Industries, Incorporated. Vehicle front having asymmetrical windshields. 4,108,488, Cl. 296-84.00R.

Tantraporn, Wirojana; and Yu, Se Puan, to General Electric Company. Avalanche memory triode and logic circuits. 4,109,169, Cl. 307-302.000.

Tapley, Claude D. Method of producing a multi-gage strip or shape from powdered metal. 4,108,651, Cl. 75-208.0CS.

Tappan Company, The: *See—*
Gilliom, John W.; and McFarland, Robert H., 4,108,139, Cl. 126-21.00A.

Tarr, Fred P., to Polaroid Corporation. Exposure preventing shade. 4,109,259, Cl. 354-86.000.

Tarrant Manufacturing Company: *See—*
Taylor, Bruce W.; and Murray, Gregory J., 4,108,010, Cl. 74-100.00R.

Tatani, Atsushi; Omoto, Setsuo; and Shiraishi, Yoshihiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for treating a waste gas. 4,108,959, Cl. 423-240.000.

Tate, Takao: *See—*
Niwa, Takao; Yoshioka, Mamoru; and Tate, Takao, 4,108,951, Cl. 261-34.00B.

Tatsushima, Masaru: *See—*
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,108,971, Cl. 423-428.000.

Taumann, Leonhard, to Applied Radiation. X-ray beam compensation. 4,109,154, Cl. 250-503.000.

Taylor, Bruce W.; and Murray, Gregory J., to Tarrant Manufacturing Company. Conveyor-type, hydraulic-powered, material-spreading apparatus. 4,108,010, Cl. 74-100.00R.

Taylor, Edward W.: *See—*
Beale, Harry A.; Strangman, Thomas E.; and Taylor, Edward W., 4,109,061, Cl. 428-678.000.

Taylor, Jay: *See—*
Sitter, Spencer B., 4,108,156, Cl. 126-271.000.

Taylor, Kenneth James, to Stewart-Warner Corporation. Petrol tank gauges. 4,107,998, Cl. 73-313.000.

Tazuma, James J.; and Zadra, Mario D., to Goodyear Tire & Rubber Company, The. Metal salts of modified anhydride resin. 4,108,944, Cl. 260-879.000.

Team, Inc.: *See—*
Harrison, George W.; and Huff, Charles O., 4,108,194, Cl. 137-15.000.

Teccor Electronics, Inc.: *See—*
Mason, William B., 4,109,306, Cl. 363-61.000.

Tech. Ontwikkelingsbureau Van Elten B.V.: *See—*
Van Elten, Gerrit Jan; and Hurkmans, Antonius, 4,108,056, Cl. 99-452.000.

Teche, Andre: *See—*
Bonne, Claude; Perronnet, Jacques; and Teche, Andre, 4,108,993, Cl. 424-248.570.

Teijin Limited: *See—*
Hayashi, Kazushige; Fujimoto, Iwao; Morishita, Toshio; Minemura, Norihiro; Yoshida, Norio; Ozaki, Kiyotaka; and Shinoki, Takanori, 4,109,038, Cl. 428-91.000.

Tektronix, Inc.: *See—*
Dalton, Oliver, 4,109,182, Cl. 315-392.000.

Teledyne, Inc.: *See—*
Benson, James M., 4,107,991, Cl. 73-204.000.

Teledyne Industries, Inc.: *See—*
Hickman, Clarence J.; Ruehmann, Donald W.; and Elkins, Christopher W., 4,108,167, Cl. 128-66.000.

Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc.: *See—*
Goddard, Terrence P., 4,108,697, Cl. 149-19.300.

Telefonaktiebolaget L M Ericsson: *See—*
Olsson, Mats Gunnar; Tollerz, Carl Ove; and Wretemark, Sven Gunnar, 4,109,098, Cl. 174-106.0SC.

Tellman, Stephen J., to Champion International Corporation. Construction panel with non-skid surface and method of fabrication. 4,109,041, Cl. 428-147.000.

Tenkman, Robert Henry; Furler, Alan George; and McGinnis, Edward F., Jr., to NDM Corporation. Multiple choke assembly. 4,109,223, Cl. 336-84.00C.

Terui, Sadao: *See—*
Komai, Atsushi; Shirane, Naoyuki; Ito, Yuji; Terui, Sadao; and Ninomiya, Michikazu, 4,108,863, Cl. 260-314.500.

Teschemacher, Charles R.: *See—*
Creighton, Charles P.; and Teschemacher, Charles R., 4,109,074, Cl. 526-320.000.

Teshima, Shizuhiro: *See—*
Fujioka, Tokio; Kinugasa, Masayuki; Iizumi, Shozo; Teshima, Shizuhiro; and Shimizu, Isamu, 4,108,641, Cl. 75-124.000.

Teulon, Jean-Marie: *See—*
Cognacq, Jean-Calude; Schweisguth, Bernard; and Teulon, Jean-Marie, 4,109,008, Cl. 424-273.00R.

Texaco Inc.: *See—*
Estes, John H.; Kravitz, Stanley; and Brandenburg, John T., 4,108,218, Cl. 141-1.000.
Flournoy, Kenoth H.; Cardenas, Ricardo L.; and Carlin, Joseph T., 4,108,193, Cl. 137-13.000.

Texas Instruments Incorporated: *See—*
Hanni, Stephen L.; and Johnson, Dudley B., 4,109,298, Cl. 361-412.000.
Marcoux, Leo; and Berg, Peter G., 4,108,125, Cl. 123-122.00F.

Textron, Inc.: *See—*
Hunke, Siegfried H., 4,107,971, Cl. 72-237.000.

Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.

Thaddey, Kurt: *See—*
Brands, Jacobus; and Thaddey, Kurt, 4,108,706, Cl. 156-384.000.

Thaler, Sheldon: *See—*
Cannon, Robert Lee, III, 4,108,148, Cl. 128-419.0PG.

Thenard, Jean: *See—*
Onillon, Michel; Roche, Pierre; and Thenard, Jean, 4,109,159, Cl. 250-564.000.

Thermco Products Corporation: *See—*
West, Ernest James; and Brandenburg, Gary M., 4,108,420, Cl. 251-129.000.

Thermo Electron Corporation: *See—*
Searight, Edward F.; and Flanagan, Paul, 4,108,242, Cl. 165-164.000.

Theurer, Richard, to Prontor-Werk Alfred Gauthier GmbH. Shutter control apparatus for camera devices. 4,109,267, Cl. 354-266.000.

Thiehofe, Theodor, to Gewerkschaft Walter. Method and apparatus for sinking shafts. 4,107,930, Cl. 61-41.00R.

Thiemann, Volker: *See—*
Fleckenstein, Wolfgang; and Thiemann, Volker, 4,108,163, Cl. 128-2.00H.

Thiokol Corporation: *See—*
Ashmore, Charles I.; Combs, Charles S., Jr.; and Stephens, William D., 4,108,696, Cl. 149-19.200.
Sottosanti, Philip C.; Baker, William H.; and Dolling, William T., 4,108,381, Cl. 239-265.350.

Thom, Joseph R. Method for making a fishing lure. 4,108,955, Cl. 264-222.000.

Thoma, Frank, to Daimler-Benz Aktiengesellschaft. Fuel injection valve with stepped injection. 4,108,383, Cl. 239-533.500.

Thomas, Andre. Process for extracting and processing glycoproteins, mucopolysaccharides and accompanying substances. 4,108,849, Cl. 260-122.000.

Thomas, Anthony Vincent, to Precision Paper Tube Company. Snap cutter apparatus for paper tubes. 4,108,034, Cl. 83-361.000.

Thomas Industries of Tennessee, Inc.: *See*—
Marcell, William B., 4,108,279, Cl. 184-15.00R.
Thomas, John Henry, III: *See*—
Lesh, Nathan George, deceased; Merchants National Bank of Allentown, executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,109,297, Cl. 361-402.000.
Thomas, Paul Vernon, to Pennwalt Corporation. Dustless soil release-souring compositions for use in laundering. 4,108,780, Cl. 252-8.600.
Thompson, Anita L. Fire protective grease catcher. 4,108,332, Cl. 220-370.000.
Thompson, James L., to Dow Chemical Company, The. Foaming and silt suspending agent. 4,108,782, Cl. 252-8.55C.
Thompson, Jerome B. Low calorie diet bread. 4,109,018, Cl. 426-62.000.
Thompson, Thomas D., to Yara Engineering Corporation. Color developing coating using unrefined clays on paper. 4,109,049, Cl. 428-331.000.
Thomson, Benjamin M.: *See*—
Bowling, Teamus; and Thomson, Benjamin M., 4,109,226, Cl. 337-130.000.
Thomson, George V. Rolling pin construction. 4,107,830, Cl. 29-110.500.
Thone, Bernd: *See*—
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.
Thorstensson, Gustav Yngve: *See*—
Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, 4,108,005, Cl. 73-514.000.
Thyssen Industrie Aktiengesellschaft: *See*—
Herbst, Rolf, 4,108,045, Cl. 89-36.00K.
Thyssen Purofer GmbH: *See*—
Lange, Georg, 4,108,636, Cl. 75-35.000.
Tiemann, Reinhard, to Continental Gummi-Werke Aktiengesellschaft. Vehicle wheel with rubber tire. 4,108,228, Cl. 152-7.000.
Timchenko, Viktor Anatolievich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Baglai, Vitaly Mikhailovich; Artamonov, Viktor Leonidovich; Garkaljuk, Rodimir Ivanovich; Timchenko, Viktor Anatolievich; Malichenko, Evgeny Fedorovich; Stupak, Leonid Mikhailovich; and Dubinsky, Rudolf Solomonovich, 4,108,235, Cl. 164-252.000.
Timco Engineering, Inc.: *See*—
Schultheis, James R., 4,109,193, Cl. 320-2.000.
Timm, Edward E.; and Townsend, Donald I., to Dow Chemical Company, The. Method for reducing concentration of harmful or offensive vapors in the atmosphere. 4,108,113, Cl. 123-3.000.
Tip Top Industries, Inc.: *See*—
Dumesnil, Eugene F., Jr., 4,107,815, Cl. 15-257.050.
Tisell, Claes Gustav Erik Yngve; Svensson, Lars-Goran; Karlstedt, Gustav Sven Erik; Thorstensson, Gustav Yngve; and Hartmann, John Fredrik Alf, to Forenade Fabriksverken. Vehicle deceleration sensing device. 4,108,005, Cl. 73-514.000.
Tiskus, John R.: *See*—
Readal, Gerald J.; Tiskus, John R.; and Tomcanin, William J., 4,109,142, Cl. 235-92.0DN.
TK Valve Limited: *See*—
Calvert, Michael Arnold; and Senger, David Joseph, 4,108,196, Cl. 137-72.000.
TMC Corporation: *See*—
Weigl, Erwin; and Svoboda, Josef, 4,108,466, Cl. 280-605.000.
Tokai-Rika-Denki-Seisakusho: *See*—
Oishi, Susumu; and Iwatsuki, Masahiro, 4,108,394, Cl. 242-107.40A.
Tokico Ltd.: *See*—
Kato, Tetuo, 4,108,287, Cl. 188-315.000.
Tokico Ltd: *See*—
Nagase, Toshiro; and Hatakeyama, Susumu, 4,108,416, Cl. 248-400.000.
Tokuda, Akira: *See*—
Ito, Ryozo; and Tokuda, Akira, 4,108,123, Cl. 123-119.0EC.
Tokyo Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Komatu, Kisao, 4,108,305, Cl. 206-330.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Katakura, Masayuki; and Yamada, Hisashi, 4,109,165, Cl. 307-229.000.
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,108,155, Cl. 126-270.000.
Sasaki, Minoru, 4,109,141, Cl. 235-92.0CA.
Tokyo Yogyo Kabushiki Kaisha: *See*—
Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, 4,108,675, Cl. 106-56.000.
Tollerz, Carl Ove: *See*—
Olsson, Mats Gunnar; Tollerz, Carl Ove; and Wretemark, Sven Gunnar, 4,109,098, Cl. 174-106.0SC.
Tomalinas, William R., Jr.; and Gurbst, Herbert S., to Roth American, Inc. Child's desk with slide-door and guideway therefor. 4,108,517, Cl. 312-297.000.
Tomcanin, William J.: *See*—
Readal, Gerald J.; Tiskus, John R.; and Tomcanin, William J., 4,109,142, Cl. 235-92.0DN.
Tomioka, Shinji: *See*—
Shirahata, Kunikatsu; Tomioka, Shinji; Nara, Takashi; Matsushima, Hideo; and Matsubara, Isao, 4,109,077, Cl. 536-17.000.
Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Waveform producing system. 4,109,208, Cl. 328-13.000.
Tomita, Koji: *See*—
Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, 4,108,725, Cl. 195-96.000.
Tomita, Yoshimori; Ozeki, Hideyoshi; and Takashima, Hisashi, to Nippon Kokan Kabushiki Kaisha; and Tokyo Yogyo Kabushiki Kaisha. Brick for sliding closure of vessel for holding molten metal. 4,108,675, Cl. 106-56.000.
Tomizawa, Choji: *See*—
Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, 4,108,819, Cl. 260-29.6NR.
Tompkins, James Darrell, to International Business Machines Corporation. Self-scanning photo-sensitive circuits. 4,109,284, Cl. 358-212.000.
Tong, George L.: *See*—
Henry, David W.; and Tong, George L., 4,109,076, Cl. 536-4.000.
Tong, Yulan C., to Dow Chemical Company, The. Microbicidal (pyridinylamino) alkyl guanidines. 4,108,859, Cl. 260-296.00R.
Tonomura, Shinji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuno; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,108,986, Cl. 424-177.000.
Toratani, Hisayoshi; and Izumitani, Tetsuro, to Hoya Corporation. Optical phosphate glass in which the length of the light path is temperature independent. 4,108,673, Cl. 106-47.00Q.
Toray Industries, Inc.: *See*—
Kondo, Tsuneyuki; and Kuroda, Akio, 4,108,895, Cl. 260-566.00A.
Torii, Takashi: *See*—
Kurita, Tetsuya; Suwa, Seiichi; Nakamura, Masayuki; and Torii, Takashi, 4,108,777, Cl. 210-225.000.
Torres, Richard J. Wax-stripper and applicator device. 4,107,813, Cl. 15-246.000.
Toshiba House Living Industry Co., Ltd.: *See*—
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,108,155, Cl. 126-270.000.
Toshiba Silicone Co., Ltd.: *See*—
Hatanaka, Masayuki; Matsumoto, Makoto; and Yonezawa, Masaharu, 4,108,833, Cl. 528-31.000.
Towmotor Corporation: *See*—
Wojtyna, Elias, 4,108,266, Cl. 180-68.500.
Townsend, Darold I. Fan rotor means. 4,108,568, Cl. 415-98.000.
Townsend, Donald I.: *See*—
Timm, Edward E.; and Townsend, Donald I., 4,108,113, Cl. 123-3.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Tachibana, Yoshishige, 4,107,801, Cl. 8-152.000.
Toyo Kogyo Co., Ltd.: *See*—
Yamamoto, Kenichi; Hirose, Yutaka; and Maeda, Tooru, 4,108,137, Cl. 123-242.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Nohara, Shigezo, 4,109,037, Cl. 428-35.000.
Toyoda-Koki Kabushiki-Kaisha: *See*—
Shima, Yoshio; Noda, Shigeo; and Owa, Kaoru, 4,109,188, Cl. 318-602.000.
Toyoshima, Toshihiko, to Xerox Corporation. Vocal timing indicator device for use in voice recognition. 4,109,104, Cl. 179-1.0SD.
Toyoshima, Yasuo: *See*—
Minowa, Seigi; Toyoshima, Yasuo; Yasuda, Nozomi; and Tanaka, Toshiro, 4,108,879, Cl. 260-405.600.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Arai, Hajime; and Ohnuma, Kiyoshi, 4,108,022, Cl. 74-645.000.
Arai, Hajime; and Ohnuma, Kiyoshi, 4,108,289, Cl. 192-3.300.
Ito, Ryozo; and Tokuda, Akira, 4,108,123, Cl. 123-119.0EC.
Kondo, Yutaka; and Nishina, Shuho, 4,108,471, Cl. 280-747.000.
Konishi, Masami; Nakamura, Norihiko; Kobayashi, Tatsuo; and Baika, Toyokazu, 4,108,133, Cl. 123-191.00S.
Niwa, Takao; Yoshioka, Mamoru; and Tate, Takao, 4,108,951, Cl. 261-34.00B.
Sanada, Masakatsu; and Nakada, Masahiko, 4,108,126, Cl. 123-122.00E.
Tozzi, Antonio: *See*—
Cassandrini, Paolo; and Tozzi, Antonio, 4,108,829, Cl. 260-45.8NT.
Tozzi, Louis M.: *See*—
Hinman, Wilbur S., Jr.; Sommer, Helmut; and Tozzi, Louis M., 4,108,075, Cl. 102-214.000.
Trallfa Nils Underhaug A/S: *See*—
Inoue, Kiyoshi; and Molaug, Ole, 4,108,357, Cl. 235-119.000.
Molaug, Ole, 4,107,948, Cl. 64-2.00P.
Tramier, Bernard; Delourme, Raymond; and Fresnel, Philippe, to Societe Nationale des Petroles d'Aquitaine. Sulphoxides. 4,108,866, Cl. 260-329.00R.
Treaty Products Incorporated: *See*—
Unger, Harold Victor, 4,108,065, Cl. 100-215.000.
Tredway, Wynn B., Sr. Golf swing training apparatus and method. 4,108,441, Cl. 273-186.00A.
Trinks, Walter Louis Adolf; and Struth, Wolfgang Ferdinand, to Deutsch-Franzosisches Forschungsinstitut. Armor-piercing projectile having spaced cores. 4,108,072, Cl. 102-52.000.
Trio Engineering Ltd.: *See*—
Helgesen, Willy, 4,107,904, Cl. 53-142.000.
Trio Kabushiki Kaisha: *See*—
Iimura, Koichi, 4,108,510, Cl. 312-8.000.
Triumph Werke Nurnberg A.G.: *See*—
Skrzipek, Jurgen; and Reuter, Helge, 4,108,557, Cl. 400-697.100.
Trivedi, Bhupendra C.; Grimm, Robert A.; and McConnell, R. B., to Ashland Oil, Inc. Method for quaternizing imidazolines. 4,109,094, Cl. 548-347.000.

Trivedi, Prakash Druman: *See—*
Bohm, Georg Gustav Anton; Trivedi, Prakash Druman; and Valaitis, Joseph Kestutis, 4,108,749, Cl. 204-159.170.
Trofimov, Valery Ivanovich: *See—*
Kharazov, Konkordy Innokentievich; Netsvetaev, Gennady Viktorovich; and Trofimov, Valery Ivanovich, 4,109,219, Cl. 335-78.000.
Trott, Arthur F.: *See—*
Hartman, Robert M.; and Trott, Arthur F., 4,108,182, Cl. 128-305.000.
Trozzi, Norman Kenneth, to Foster Wheeler Energy Corporation. Multiple point feeder. 4,108,301, Cl. 198-633.000.
True Temper Corporation: *See—*
Rebhun, Charles F., 4,107,841, Cl. 30-276.000.
Truman, Peter T.: *See—*
Eastcott, Peter DeH.; and Truman, Peter T., 4,108,280, Cl. 187-20.000.
Trussell, Gerald C.; and Arnston, Robert W., to Sun Electric Corporation. Vehicle diagnosis data entry system. 4,108,362, Cl. 235-375.000.
TRW Inc.: *See—*
McKee, William H., 4,108,526, Cl. 339-103.00M.
Rizzo, Anthony A., 4,108,424, Cl. 267-160.000.
Tschunt, Edgar; Platz, Winfried; Bar, Ulrich; and Heinz, Lothar, to Siemens Aktiengesellschaft. Gamma camera. 4,109,155, Cl. 250-505.000.
Tsukada, Katsushige: *See—*
Hayashi, Nobuyuki; Isobe, Asao; Tsukada, Katsushige; and Ishimaru, Toshiaki, 4,108,666, Cl. 96-115.00P.
Tsukiura, Hiroshi: *See—*
Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, 4,108,725, Cl. 195-96.000.
Tsumura, Yoshishige, to Mitsui Aluminum Co., Ltd. Process for production of aluminum. 4,108,741, Cl. 204-67.000.
Tsunekawa, Tokuichi: *See—*
Okuno, Youichi; Kiyohara, Takehiko; Tsunekawa, Tokuichi; and Hashimoto, Teiji, 4,109,257, Cl. 354-23.00R.
Tsuru, Shinobu: *See—*
Oyamada, Takeo; Tsuru, Shinobu; Tomizawa, Choji; and Taira, Yoshito, 4,108,819, Cl. 260-29.6NR.
Tucker, James E.; Burck, Joseph M.; and Morrison, Howard J., to Marvin Glass & Associates. Action toy for land and water. 4,107,872, Cl. 46-103.000.
Turner, Roger C.: *See—*
Knight, J. Nelson; and Turner, Roger C., 4,107,833, Cl. 29-460.000.
Twiflex Couplings Limited: *See—*
Stewart, John; and Stevens, Roger Charles, 4,108,294, Cl. 192-85.00R.
Tylan Corporation: *See—*
Dozier, Alfred R., 4,108,106, Cl. 118-49.000.
Tyler, Hugh J., to Robertshaw Controls Company. Electrical unit having a bus-bar and a selector and method of making the same. 4,109,120, Cl. 200-51.00R.
Typpo, Pekka Matti; Wennerberg, Gunnar; and Larsen, Tor Grotnes, to Measurex Corporation. Contacting caliper gauge. 4,107,847, Cl. 33-147.00L.
Tysdal, Daryl D. Flexible covering anchor. 4,107,826, Cl. 24-243.00K.
Uarco Incorporated: *See—*
Peschke, Gordon C., 4,108,352, Cl. 229-69.000.
Ubel, Helmut, to International Standard Electric Corporation. Arrangement for protecting data communication in a continuous automatic train control system. 4,108,404, Cl. 246-34.0CT.
Uchida, Kazuo: *See—*
Kawahara, Toshihisa; Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,109,079, Cl. 536-26.000.
Uchiyama, Hiroaki: *See—*
Mitsuyama, Akira; Uchiyama, Hiroaki; and Deguchi, Masanobu, 4,108,544, Cl. 355-8.000.
Uchiyama, Yasuji: *See—*
Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, 4,109,208, Cl. 328-13.000.
Ue, Raymond C.: *See—*
Froyd, Stanley G.; Ue, Raymond C.; and Buchanan, John Paul, 4,109,185, Cl. 318-571.000.
Ueno, Shoji, to Victor Company of Japan, Limited. Peak level indicating electronic circuit. 4,109,198, Cl. 324-103.00P.
Ueno, Zene: *See—*
Kosaka, Katuaki; and Ueno, Zene, 4,108,114, Cl. 123-3.000.
Ugine Aciers: *See—*
Armand, Marcel; and Charquet, Daniel, 4,108,687, Cl. 148-2.000.
Uibel, Paul-Ulrich: *See—*
Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, 4,108,054, Cl. 99-348.000.
Ullman, Myron E., Jr., to Kessler Products Co., Inc. Snap-in plastic frame for panels. 4,107,897, Cl. 52-823.000.
UMC Industries, Inc.: *See—*
Falk, Leonard P.; Stadler, Robert L.; and Alford, James R., 4,108,333, Cl. 221-13.000.
Unex Conveying Systems, Inc.: *See—*
McKnight, Robert J.; Neuwirth, Frank J.; and Gotham, Robert W., 4,108,304, Cl. 198-781.000.
Unger, Harold Victor, to Treaty Products Incorporated. Can compactor. 4,108,065, Cl. 100-215.000.
Unger, Ronald James; and Spoonamore, John Gilbert, to Dana Corporation. System for maintaining level of oil in engine. 4,107,984, Cl. 73-113.000.
Ungerer geb. Dollinger, Irma: *See—*
Ihle, Josef, 4,107,970, Cl. 72-165.000.
Unicare Systems, Inc.: *See—*
Saliaris, George P., 4,108,181, Cl. 128-303.100.
Union Carbide Corporation: *See—*
Austin, Terry Marshall; Carroll, Eugene Thomas; and Bowen, Mildred Choi, 4,108,552, Cl. 356-87.000.
Kaufman, George, 4,108,222, Cl. 141-337.000.
Uniroyal, Inc.: *See—*
Mao, Chung-Ling, 4,108,868, Cl. 260-332.100.
McCoy, Robert H., 4,109,039, Cl. 428-95.000.
United Merchants and Manufacturers, Inc.: *See—*
Pappas, Charles, 4,108,595, Cl. 8-1.00A.
United States Gypsum Company: *See—*
Wendt, Alan C., 4,107,887, Cl. 52-105.000.
United States of America
Agriculture: *See—*
Portnoy, Norman A.; Arthur, Jett C., Jr.; Margavio, Matthew F.; and Nelson, Marie C., 4,108,748, Cl. 204-159.120.
Air Force: *See—*
Arnold, Fred E.; and Wolfe, James F., 4,108,835, Cl. 528-183.000.
Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., 4,108,926, Cl. 260-874.000.
Crane, Robert L.; Grandt, Alten F., Jr.; and Gallagher, Joseph P., 4,107,980, Cl. 73-88.00R.
Davis, Dale M., 4,108,073, Cl. 102-52.000.
Evers, Robert C., 4,108,884, Cl. 260-453.0RW.
O'Connell, Robert M., 4,109,172, Cl. 310-313.000.
O'Connell, Robert M., 4,109,173, Cl. 310-313.000.
Army: *See—*
Clodfelter, Glen A., 4,108,700, Cl. 156-153.000.
Drzewiecki, Tadeusz M.; and Manion, Francis M., 4,108,721, Cl. 176-36.00R.
Epstein, Joseph; and Davis, George T., 4,108,950, Cl. 260-986.000.
Gorfien, Harold; Rahman, Abdul R.; and Westcott, Donald E., 4,109,020, Cl. 426-241.000.
Hayes, Hugh V., 4,108,390, Cl. 242-55.530.
Hinman, Wilbur S., Jr.; Sommer, Helmut; and Tozzi, Louis M., 4,108,075, Cl. 102-214.000.
Merriam, Arthur T., 4,108,191, Cl. 135-2.000.
Mill, Theodore; Gould, Constance W.; Epstein, Joseph; and Schiff, Leon J., 4,108,746, Cl. 204-158.00R.
Proto, Richard C., 4,108,359, Cl. 235-304.000.
Rahman, Abdul R.; and Haralampu, Stephen G., 4,109,026, Cl. 426-640.000.
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Doody, Thomas J., 4,108,207, Cl. 137-625.470.
Steyert, William A., Jr., 4,107,935, Cl. 62-3.000.
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Kantor, Gideon, 4,108,147, Cl. 128-404.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Holley, Larry D.; and Ward, James O. Digital automatic gain amplifier. 4,109,213, Cl. 330-2.000.
National Aeronautics and Space Administration: *See—*
Fortini, Anthony; and Kazaroff, John M., 4,108,241, Cl. 165-146.000.
Sokolowski, Daniel E., 4,107,919, Cl. 165-169.000.
Navy: *See—*
Ball, Raymond L.; Leverone, Paul G.; and Biegler, Warren H., 4,109,199, Cl. 324-202.000.
Bates, Albert M.; Sandford, Wayne H., Jr.; and Madera, Anthony J., 4,109,232, Cl. 340-6.00R.
Groutage, Frederick D.; and Borunda, Gabriel S., 4,108,400, Cl. 244-3.150.
Heller, Carl A., 4,108,604, Cl. 23-230.00R.
Kiraly, Louis J., 4,108,046, Cl. 89-43.00A.
Martin, William E., 4,108,622, Cl. 65-30.00R.
McCartney, Joseph F.; and Gundersen, Charles R., 4,109,062, Cl. 429-6.000.
Nyswander, Reuben E., 4,109,216, Cl. 331-87.000.
Potter, Vernon L., 4,107,946, Cl. 62-514.00R.
Stine, Clifton E.; Chartier, Woodrow D., Jr.; and Caponegro, Mike A., 4,108,025, Cl. 81-3.00R.
Wrench, Edwin H., Jr.; Hicks, Jay C.; and McCartney, Joseph F., 4,109,117, Cl. 179-175.30F.
U.S. Packaging Corp.: *See—*
Mennen, Frederick C., 4,108,729, Cl. 195-127.000.
U.S. Philips Corporation: *See—*
Durr, Heinrich; and Haubrich, Lothar, 4,108,297, Cl. 400-354.000.
Eggermont, Ludwig Desire Johan; Dijkmans, Eise Carel; and Riemens, Karel, 4,109,203, Cl. 325-38.00B.
Heuser, Rolf; and Govaert, George Albert, 4,109,162, Cl. 307-203.000.
Schylander, Eric Christian, 4,109,277, Cl. 358-8.000.
Voss, Rainer, 4,109,106, Cl. 179-1.00N.
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Graham, Robert Malcolm, 4,108,481, Cl. 285-231.000.
United States Steel Corporation: *See—*
Martin, Wayne A., 4,107,972, Cl. 72-334.000.
Readal, Gerald J.; Tiskus, John R.; and Tomcanin, William J., 4,109,142, Cl. 235-92.0DN.
United Technologies Corporation: *See—*
Beale, Harry A.; Strangman, Thomas E.; and Taylor, Edward W., 4,109,061, Cl. 428-678.000.

Egan, William J., Jr.; and Mazer, Lloyd M., 4,108,591, Cl. 431-121.000.
Jowett, Terence W.; and Smith, Harvey A., 4,108,008, Cl. 73-756.000.
Marscher, William D., 4,109,031, Cl. 427-191.000.
Platt, Charles Elmore, 4,108,572, Cl. 416-230.000.
Salkeld, Richard W., 4,108,236, Cl. 164-338.00R.

Universal Fluid Heads (Aust.) Pty. Limited: *See*—
Miller, Robert Eric; and Jackson, Stanley Bishop, 4,108,412, Cl. 248-181.000.

Universities Federation for Animal Welfare: *See*—
Scott, Walter Norris; and MacArthur, Judy Anne, 4,107,818, Cl. 17-51.000.

University of Akron, The: *See*—
Fetters, Lewis J.; and Bi, Le-Khac, 4,108,945, Cl. 260-880.00B.

University of California, The Regents of the: *See*—
Fukuto, Tetsuo Roy; and Black, Allan Lindsay, 4,108,991, Cl. 424-248.500.

University of Chicago: *See*—
Fried, Josef; and Elliott, William J., 4,108,870, Cl. 260-340.90R.

Unkauf, Manfred G., to Raytheon Company. Reverberation compensating communication system. 4,109,100, Cl. 178-67.000.

UOP Inc.: *See*—
Gewartowski, Steve A., 4,108,914, Cl. 260-671.00R.
Hemler, Charles L.; and Stine, Laurence O., 4,108,795, Cl. 252-419.000.
Rosback, Donald H.; and Neuzil, Richard W., 4,108,915, Cl. 260-674.0SA.
Ryu, Ji-Yong, 4,108,920, Cl. 260-683.15B.

Upjohn Company, The: *See*—
Chen, Augustin T.; and Onder, Kemal B., 4,108,843, Cl. 528-74.000.
Morton, Douglas Ross, Jr., 4,108,878, Cl. 260-408.000.
Nelson, Norman A., 4,108,900, Cl. 260-590.00C.
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Sih, John C., 4,109,082, Cl. 542-426.000.
Wingard, Robert Dean, 4,108,606, Cl. 23-252.00R.

Urai, Muneharu; Goto, Shuichi; and Fukui, Yutaka, to Tachikawa Spring Co., Ltd. Method of manufacturing seat cushions. 4,107,829, Cl. 29-91.100.

Urlaub, Reinhold: *See*—
Grampp, Ekkehard; Schmitt, Reinhold; and Urlaub, Reinhold, 4,109,017, Cl. 426-51.000.

USM Corporation: *See*—
Renner, Wolf; and Mauer, Dieter, 4,108,507, Cl. 308-238.000.

Usuda, Shinji: *See*—
Murakami, Masuo; Takahashi, Kozo; Kawashima, Yuji; Kojima, Tadao; Niigata, Kunihiro; Fujikura, Takashi; Nozaki, Yoshihisa; Tachikawa, Shiro; Usuda, Shinji; and Kagami, Soichi, 4,109,088, Cl. 544-174.000.

Vachenauer, Erwin; and Mueller, Bernd, to Siemens Aktiengesellschaft. Circuit for the comparative vector measurement of radio signal pulses which arrive approximately simultaneously in a plurality of receivers. 4,109,250, Cl. 343-112.00R.

Vajna, Sandor, to Vajna, Sandor. Ion exchange process with countercurrent fractional regeneration. 4,108,766, Cl. 210-32.000.

Valaitis, Joseph Kestutis: *See*—
Bohm, Georg Gustav Anton; Trivedi, Prakash Druman; and Valaitis, Joseph Kestutis, 4,108,749, Cl. 204-159.170.

Valerio, Robert Michael. Traction device. 4,108,267, Cl. 180-71.000.

Valiga, Richard E. Process for treating waste sludge from combustion plant desulfurization units and cementitious product of the process. 4,108,677, Cl. 106-109.000.

Valyocsik, Ernest William: *See*—
Rollmann, Louis Deane; and Valyocsik, Ernest William, 4,108,881, Cl. 260-448.00C.

Vanassche, Willy Joseph; Philippaerts, Herman Adelbert; Duville, Rene Omer; and Schelfaut, Francois Leon, to Agfa-Gevaert, N.V. Lippmann-emulsions and reversal processing thereof. 4,108,661, Cl. 96-59.000.

vanden Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., to Monroe Auto Equipment Company. Windshield wiper construction. 4,107,814, Cl. 15-250.420.

van der Breggen, Gerrit: *See*—
de Boer, Henri G. J.; van der Breggen, Gerrit; and Wemmers, Anton, 4,108,664, Cl. 96-75.000.

van der Lely, Cornelis. Agricultural implements. 4,108,089, Cl. 111-7.000.

van der Walt, Johann George: *See*—
Nyman, Roland John; and van der Walt, Johann George, 4,108,171, Cl. 128-142.200.

Vanderwerf, Dennis F.: *See*—
Anderson, Raymond H.; and Vanderwerf, Dennis F., 4,108,540, Cl. 350-211.000.

van der Zeeuw, Abraham J.: *See*—
Kok, Riekert; and van der Zeeuw, Abraham J., 4,108,958, Cl. 423-24.000.

Van Dort, Jacobus Maurits, to Hollandse Signaalapparaten B.V. Method of manufacturing twistless yarn and yarn obtained by this method. 4,107,914, Cl. 57-164.000.

Van Dyke, Dave: *See*—
Nelson, David H., 4,108,154, Cl. 126-270.000.

Van Dyke, Homer: *See*—
Nelson, David H., 4,108,154, Cl. 126-270.000.

van Eekelen, Alex H.: *See*—
vanden Berg, Johan H.; van Eekelen, Alex H.; and Hoebrechts, Albert G., 4,107,814, Cl. 15-250.420.

Van Elten, Gerrit Jan; and Hurkmans, Antonius, to Tech. Ontwikkelingsbureau Van Elten B.V. Apparatus for storing cheese loaves and for periodically turning them upside down. 4,108,056, Cl. 99-452.000.

van Hardeveld, Rudolf; and Hendriks, Petrus F.A.M., to Stamicarbon, B.V. A process for preparing melamine. 4,109,090, Cl. 544-201.000.

Van Herten, Jozef Marie, to Oce-van der Grinten N.V. Power control circuit and electro(photo)graphic apparatus employing same. 4,109,134, Cl. 219-216.000.

Van Logten, Henrious: *See*—
Gauss, Wilhelm; Van Logten, Henrious; and Kruger, Arthur, 4,108,048, Cl. 91-6.500.

van Mullekom, Hubert Peter, to Ruti-Te Strake B.V. Weaving loom with tension adjustor for warp edge threads. 4,108,214, Cl. 139-97.000.

Varga, Otto Herman, to Resilient Grip Limited. Anchorage appliance. 4,108,043, Cl. 85-70.000.

Varga, Sandor L.: *See*—
Veber, Daniel F.; Brady, Stephen F.; and Varga, Sandor L., 4,108,987, Cl. 424-177.000.

Varian Associates, Inc.: *See*—
Landfors, Arthur A., 4,108,576, Cl. 417-153.000.

Varni, Anselm Francis; and Sandor, Joseph, to Innovative Computer Products. Magnetic disc cleaning machine. 4,107,810, Cl. 15-97.00R.

Vary, Robert F.; and Mamo, Anthony C., to Vary, Robert F.; and BVM Ltd. Energy saving device for habitable building enclosures having a heat changing system. 4,108,238, Cl. 165-57.000.

Veb Polygraph Leipzig: *See*—
Werner, Hans-Dieter, 4,108,067, Cl. 101-224.000.

Veber, Daniel F.; Brady, Stephen F.; and Varga, Sandor L., to Merck & Co., Inc. Cyclic hexapeptides. 4,108,987, Cl. 424-177.000.

VEDA, Inc.: *See*—
Richardson, James L., 4,108,380, Cl. 239-172.000.

Veeder Industries, Inc.: *See*—
Bateman, Coates F.; and Soltanoff, Louis, 4,107,992, Cl. 73-260.000.

Veligura, Ilya Lukyanovich: *See*—
Brovman, Mikhail Yakovlevich; Marchenko, Ivan Konstantinovich; Kozy, Nikolai Mikhailovich; Veligura, Ilya Lukyanovich; Bairakov, Ivan Fedorovich; Dolbenko, Evgeny Tikhonovich; Kan, Jury Evgenievich; and Leites, Abram Vladimirovich, 4,108,237, Cl. 164-425.000.

Velsicol Chemical Corporation: *See*—
Anderson, Arnold L., 4,108,906, Cl. 260-609.00R.

Venetta, Henry John; Singrey, Raymond Edward; and Coughlin, John Edward, to Venetta, Inc. Method for fuel/air feed pressure control by stack temperature. 4,108,594, Cl. 432-24.000.

Venetta, Inc.: *See*—
Venetta, Henry John; Singrey, Raymond Edward; and Coughlin, John Edward, 4,108,594, Cl. 432-24.000.

Vereinigte Baubeschlagfabriken, Gretsch & Co. GmbH: *See*—
Schmidt, Manfred; and Luithlen, Heinz, 4,108,465, Cl. 280-605.000.

Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See*—
Kogler, Peter, 4,108,494, Cl. 299-1.000.

Verstraaten, Peter: *See*—
Conibear, Frank; and Verstraaten, Peter, 4,107,868, Cl. 43-88.000.

Victor Company of Japan, Limited: *See*—
Ueno, Shoji, 4,109,198, Cl. 324-103.00P.

Victoreen, John A. Hearing aid receiver with plural transducers. 4,109,116, Cl. 179-107.00E.

Vidmar, Albert J., to Sherwood Refractories Inc. Dust collection and illumination system. 4,109,144, Cl. 240-2.00V.

Vigliecca, Lucien: *See*—
Azemar, Michel; and Vigliecca, Lucien, 4,109,069, Cl. 526-65.000.

Viking Metallurgical Corp.: *See*—
Walberg, M. Victor; and Lowe, James H. C., 4,108,644, Cl. 75-135.000.

Vink, Richard C., to North American Philips Corporation. Variable brew coffee maker. 4,108,053, Cl. 99-306.000.

Vinton, David S., to Caterpillar Tractor Co. Suspension system for tandem axle vehicles. 4,108,470, Cl. 280-677.000.

Vixie, Dennis E.: *See*—
Bowerman, William J.; James, Stanley L.; and Vixie, Dennis E., 4,107,858, Cl. 36-134.000.

Vlad, Constantin: *See*—
Paulitsch, Hans; Babilon, Alfred; Kiefer, Gerhard; Koerfer, Kurt; Vlad, Constantin; and Koch, Ullrich, 4,108,695, Cl. 148-39.000.

Vock, Manfred Hugo: *See*—
Withycombe, Donald Arthur; Hruza, Anne; Vock, Manfred Hugo; Giacino, Christopher; Mookherjee, Braja Dulal; Pittet, Alan Owen; and Schreiber, William L., 4,108,876, Cl. 260-347.200.

Vogt, B. Richard: *See*—
Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., 4,108,860, Cl. 260-304.00A.

Vogt, Robert K.; and Heit, Martin A., to E. W. Buschman Company, The. Power transmission assembly for an accumulator conveyor. 4,108,303, Cl. 198-781.000.

von Allworden, Wilhelm; and Kunze, Dieter, to Jean Walterscheid GmbH. Coupling hook for a three-point attachment of a tractor. 4,108,464, Cl. 280-508.000.

von Basse, Paul Werner; and Hofmann, Rudiger, to Siemens Aktiengesellschaft. Semiconductor store. 4,109,270, Cl. 357-23.000.

von der Heyden, Horst: *See*—
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Richter, Stephan; Schaal, Helmut; and Schulze-Schoelling, Hermann, 4,109,311, Cl. 364-200.000.

Von Statten, Richard J., Jr. Earphone mounting in safety helmet for motorcycle riders. 4,109,105, Cl. 179-1.0VE.

Vorbruggen, Helmut; and Niedballa, Ulrich, to Schering Aktiengesellschaft. N-(Polysaccharidyl)-nitrogen heterocycles, especially pyrimidine or purine bases, and process for their preparation. 4,109,078, Cl. 536-26.000.

Vorontsov, Vladimir Lvovich: *See*—
Khvalovsky, Vladimir Vasilievich; Natarovsky, Sergei Nikolaevich; Nalivaiko, Valentin Iosifovich; and Vorontsov, Vladimir Lvovich, 4,109,304, Cl. 362-259.000.

Vorwerk & Co Interholding GmbH: *See*—
Klocker, Ingo; Gibiec, Oswald; Uibel, Paul-Ulrich; and Garn, Dieter, 4,108,054, Cl. 99-348.000.

Voss, Klaus: *See*—
Wanner, Karl; and Voss, Klaus, 4,107,949, Cl. 64-9.00A.

Voss, Rainer, to U.S. Philips Corporation. Audiometer. 4,109,106, Cl. 179-1.00N.

Vossen, Franz. Method of and apparatus for breaking away of prepunched pieces of material from curved or arched sheets of material. 4,108,343, Cl. 225-1.000.

Vydra, Karel: *See*—
Rahn, Martin; Reh, Lothar; Thone, Bernd; and Vydra, Karel, 4,108,634, Cl. 75-23.000.

W. R. Grace & Co.: *See*—
Crose, James R., 4,109,027, Cl. 427-28.000.

Wacker-Chemie GmbH: *See*—
Kratel, Gunter; Muhlhofer, Ernst; and Schreiner, Franz, 4,108,964, Cl. 423-336.000.

Wacker-Chemitronik Gesellschaft fur Elektronik-Grundstoffe mbH: *See*—
Kohl, Franz, 4,109,128, Cl. 219-10.430.

Wada, Tsuneo: *See*—
Habu, Teiji; Yamaguchi, Hisashi; Sasaki, Takashi; Wada, Tsuneo; Matsumoto, Masayuki; Omura, Takayoshi; and Ishii, Hiroki, 4,108,848, Cl. 260-117.000.

Wade, Peter C.; Vogt, B. Richard; and Kissick, Thomas P., to E. R. Squibb & Sons, Inc. Triazolobenzisothiazole-1,1-dioxides. 4,108,860, Cl. 260-304.00A.

Wagner, John T., to Westinghouse Electric Corp. Vibratory tuning of rotatable blades for elastic fluid machines. 4,108,573, Cl. 416-236.00A.

Wagner, Josef: *See*—
Grill, Helmut; Zschocke, Rainer Hans; Wagner, Josef; Hofrichter, Gernot; and Janiak, P. Stefan, 4,109,013, Cl. 424-315.000.

Wagner, Sigurd: *See*—
Pritchard, Assunta Anna; and Wagner, Sigurd, 4,108,716, Cl. 156-636.000.

Wakatsuki, Yuzo: *See*—
Tanaka, Takehiko; Wakatsuki, Yuzo; and Niiya, Toshio, 4,108,364, Cl. 235-419.000.

Wakimura, Yutaka, to West Electric Company, Ltd. Adaptor for photographic flash device. 4,109,301, Cl. 362-7.000.

Waku, Makio: *See*—
Minami, Hidehiro; and Waku, Makio, 4,108,121, Cl. 123-119.0EC.

Wakui, Kotaro: *See*—
Hirose, Ryusho; and Wakui, Kotaro, 4,109,279, Cl. 358-55.000.

Walberg, M. Victor; and Lowe, James H. C., to Viking Metallurgical Corp. Manufacture of reactive metals and alloys. 4,108,644, Cl. 75-135.000.

Walden, Carl W., to Agri-Bio Corporation. Automatic injecting apparatus. 4,108,176, Cl. 128-218.00A.

Wallace, Herbert F.; and Weir, Donald R., to Sherritt Gordon Mines Limited. Hydrometallurgical process for the production of cobalt powder from mixed metal sulphides. 4,108,640, Cl. 75-103.000.

Wallack, Marc K., to Wistar Institute, The. Viral oncolysate vaccine for stimulating the immune mechanism of mammals to species-specific tumors. 4,108,983, Cl. 424-89.000.

Walter, Derek Oscar, to Johnson, Matthey & Co., Limited. Accelerometers. 4,108,006, Cl. 73-517.00R.

Walter, Lothar: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,503, Cl. 308-6.00C.
Ernst, Horst Manfred; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,108,504, Cl. 308-6.00C.

Wandler, Richard A., to General Electric Company. Female terminal and method of making such. 4,108,530, Cl. 339-256.0SP.

Wang, Tse Lin: *See*—
Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, 4,109,113, Cl. 179-99.000.

Wanner, Karl; and Voss, Klaus, to Robert Bosch GmbH. Tool shank and chuck combination for hammer drill. 4,107,949, Cl. 64-9.00A.

Ward, James O.: *See*—
United States of America, National Aeronautics and Space Administration; Holley, Larry D.; and Ward, James O., 4,109,213, Cl. 330-2.000.

Wareham, Richard R., to Polaroid Corporation. Flip flash having automatic indicator control. 4,109,302, Cl. 362-10.000.

Warner, Harlow L.: *See*—
Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,108,630, Cl. 71-94.000.

Warner, John Craig; and Gravel, Mark William, to Borg-Warner Corporation. Power transmission belt. 4,108,012, Cl. 74-231.00C.

Warner, Peter Stuart; and Bicht, John Richard, to Lucas Industries Limited. Battery packs. 4,109,064, Cl. 429-66.000.

Warren, Casimir G.: *See*—
Spino, Raymond N.; and Warren, Casimir G., 4,107,843, Cl. 32-14.00E.

Warren-Teed Laboratories, Inc.: *See*—
Johnson, Richard C.; and deBenneville, Peter L., 4,109,006, Cl. 424-277.000.

Wasilczyk, George James, to Dow Chemical Company, The. High resiliency polyurethane foams. 4,108,791, Cl. 252-182.000.

Watanabe, Hiroshi: *See*—
Hattori, Kenichi; Miya, Bunji; Matsuda, Morio; Ishii, Mutsuo; Saito, Hisashi; Watanabe, Hiroshi; and Takizawa, Hidemitu, 4,108,891, Cl. 260-528.000.

Watanabe, Kazuo; Kume, Tosiaki; Takenoya, Hideaki; Kakinuma, Toshihide; and Makabe, Hachiro, to Janome Sewing Machine Co. Ltd. Pattern stitching speed control system for electronic sewing machines. 4,108,093, Cl. 112-158.00E.

Watanabe, Mitsuru: *See*—
Satoh, Kenji; and Watanabe, Mitsuru, 4,109,129, Cl. 219-10.55B.

Watarai, Yoshiaki; Yamazaki, Haruo; Saito, Naoki; Yamaguchi, Masayuki; Okamoto, Takio; and Akutsu, Hidezo, to Matsushita Electronics Corporation. High pressure sodium vapor discharge lamp. 4,109,175, Cl. 313-112.000.

Waterhouse, John Sidney: *See*—
Green, George Edward; and Waterhouse, John Sidney, 4,108,803, Cl. 96-76.00R.

Wathen, Tom M.: *See*—
Mast, William C.; Bauer, Richard G.; and Wathen, Tom M., 4,108,923, Cl. 260-836.000.

Watson, Charles J.; and Hrastnik, Walter, to Bell & Howell Company. Light valve system for motion picture film printer. 4,108,537, Cl. 350-150.000.

Watson, Sanders Chapman. Stirling engine. 4,107,925, Cl. 60-521.000.

Wattimena, Freddy, to Shell Oil Company. Isomerization of terpene compounds. 4,108,917, Cl. 260-677.00R.

Watts, Brian Michael: *See*—
Stowell, Michael James; and Watts, Brian Michael, 4,108,691, Cl. 148-11.50A.

Wavin B.V.: *See*—
Ettema, Ernst, 4,108,480, Cl. 285-197.000.

Wayson, Andrew J., to Litton Industrial Products, Inc. Air-cooled traveler. 4,107,913, Cl. 57-125.000.

Wearmouth, William Ronald, to International Nickel Company, Inc., The. Hard, heat-resistant nickel electrodeposits. 4,108,740, Cl. 204-11.000.

Weaver, William W.: *See*—
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,108,212, Cl. 138-122.000.

Weber, Claude Edmond Georges, to Societe d'Etudes et de Realisations Electroniques. Observation and aiming apparatus, particularly on a vehicle. 4,108,551, Cl. 356-4.000.

Weber, Donald William, to Ampex Corporation. Method and apparatus for providing a stable, high gain servo system. 4,109,184, Cl. 318-327.000.

Weber, Karl-Arnold: *See*—
Konig, Eberhard; Pedain, Josef; Weber, Karl-Arnold; and Hajek, Manfred, 4,108,842, Cl. 528-61.000.

Weed Eater, Inc.: *See*—
Moore, Robert J., 4,107,901, Cl. 56-17.500.

Weedon, Gene Clyde: *See*—
Crescentini, Lamberto; Weedon, Gene Clyde; and Wells, Rodney Lee, 4,108,922, Cl. 260-830.00P.

Wegfahrt, Paul F.; Lewin, Nathan; and Monthony, James F., to Bio-Rad Laboratories, Inc. Radioimmunoassay for thyroid hormone. 4,108,974, Cl. 424-1.000.

Weigert, Karl, to Reliable Attachment Company. Ruffling attachment. 4,108,094, Cl. 112-134.000.

Weigl, Erwin; and Svoboda, Josef, to TMC Corporation. Ski brake. 4,108,466, Cl. 280-605.000.

Weiler and Company: *See*—
Weiler, James G., 4,108,387, Cl. 241-82.500.

Weiler, James G., to Weiler and Company. Hollow pin assembly for food grinders. 4,108,387, Cl. 241-82.500.

Weiner, Jerold Samuel: *See*—
Freimuth, Gerhart William; and Weiner, Jerold Samuel, 4,108,221, Cl. 141-146.000.

Weir, Donald R.: *See*—
Wallace, Herbert F.; and Weir, Donald R., 4,108,640, Cl. 75-103.000.

Weir, Gary L., to Pullman Incorporated. Fold back landing gear leg. 4,108,472, Cl. 280-763.000.

Weir Pumps Limited: *See*—
Ryall, Michael Leslie; and Robertson, James Rennie, 4,108,569, Cl. 415-112.000.

Weiss, Carl Dennis: *See*—
Allison, Charles Eugene, Jr.; Fenton, Francis Michael; Wang, Tse Lin; and Weiss, Carl Dennis, 4,109,113, Cl. 179-99.000.

Weiss & Co.: *See*—
Weiss, Josef, 4,108,771, Cl. 210-50.000.

Weiss, Josef, to Weiss & Co.; Kemiska Konsultbyran A.G.; and Chemical Consults Corp., Ltd. Elimination of odors from organic wastes. 4,108,771, Cl. 210-50.000.

Weisz, Thomas Anthony, to General Binding Corporation. Low mass electric heater. 4,108,713, Cl. 156-499.000.

Welch, Henry W., to Armstrong Cork Company. Method of and appa-

ratus for controlling thickness of coating applied to moving fabric. 4,109,034, Cl. 427-355.000.
Welch, Richard D.; and Iversen, John E., to Eastman Kodak Company. Method of forming an article-tape product. 4,108,702, Cl. 156-192.000.
Wells, Rodney Lee: *See*—
Crescentini, Lamberto; Weedon, Gene Clyde; and Wells, Rodney Lee, 4,108,922, Cl. 260-830.00P.
Wemmers, Anton: *See*—
de Boer, Henri G. J.; van der Breggen, Gerrit; and Wemmers, Anton, 4,108,664, Cl. 96-75.000.
Wendel, Ion L., to Lowe, James L. Solar collector. 4,108,159, Cl. 126-271.000.
Wendt, Alan C., to United States Gypsum Company. Sound absorbing system. 4,107,887, Cl. 52-105.000.
Wennerberg, Gunnar: *See*—
Typpo, Pekka Matti; Wennerberg, Gunnar; and Larsen, Tor Grotnes, 4,107,847, Cl. 33-147.00L.
Wenzel, Wolfgang: *See*—
Reiff, Helmut; Wenzel, Wolfgang; Grammel, Jurgen; and Dieterich, Dieter, 4,108,814, Cl. 260-29.2TN.
Wereta, Anthony, Jr.: *See*—
Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., 4,108,926, Cl. 260-874.000.
Werner, Hans-Dieter, to Veb Polygraph Leipzig. Method and apparatus for continuously printing uncased folded books. 4,108,067, Cl. 101-224.000.
Werner Peddinghaus: *See*—
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West Electric Company, Ltd.: *See*—
Wakimura, Yutaka, 4,109,301, Cl. 362-7.000.
West, Ernest James; and Brandenburg, Gary M., to Thermco Products Corporation. Adjustable gas flow control valve. 4,108,420, Cl. 251-129.000.
Westberg, John Kellogg, II, to Formistor Corporation. Method and apparatus for forming and trimming leads. 4,108,217, Cl. 140-105.000.
Westcott, Donald E.: *See*—
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Cricchi, James R.; and Fitzpatrick, Michael D., 4,109,163, Cl. 307-205.000.
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Wetzel, Alfred. Shingle-type wall panel. 4,107,896, Cl. 52-537.000.
Weyers, Richard E.: *See*—
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White, Eugene M. Cabinet mounting unit for free arm sewing machine. 4,108,512, Cl. 312-24.000.
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Wicher, Daniel P., Jr., to Burroughs Corporation. Method of making a display panel and the anodes therefor. 4,108,521, Cl. 316-17.000.
Wickersheim, August, to Wickersheim & Johne Maschinen-und Verpackungsanlagen GmbH. Fully automatic device for packing piece goods, in particular fruits. 4,107,903, Cl. 53-138.00A.
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Will, Fritz G.; and Secor, Fay W., to General Electric Company. Rechargeable aqueous zinc-halogen cell. 4,109,065, Cl. 429-105.000.
Williams, David M. Rail car safety reflector. 4,108,406, Cl. 246-474.000.
Williams, Derek Farnham; and Martin, Terence Geoffrey, to Coal Industry (Patents) Limited. Extraction of oil shales and tar sands. 4,108,760, Cl. 208-11.0LE.
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Wolze, Martin H. Coffee pot holder for recreational vehicle stove and the like. 4,108,140, Cl. 126-24.000.

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Woodstream Corporation: *See*—
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Wossner, Gunter, to Robert Bosch GmbH. Equipment for exhaust gas detoxification in internal combustion engines. 4,107,922, Cl. 60-298.000.

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Yamamoto, Kenichi; Hirose, Yutaka; and Maeda, Tooru, to Toyo Kogyo Co., Ltd. Rotary piston engines. 4,108,137, Cl. 123-242.000.

Yamana, Makoto; and Kubota, Nobunori, to Murata Kikai Kabushiki Kaisha. Pneumatic spinning apparatus. 4,107,911, Cl. 57-56.000.

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Youdelman, Myrna R. Plastic fuel, products made therefrom and a novel method for starting and promoting fires using the fuel. 4,108,611, Cl. 44-38.000.

Young, Kenneth P.: *See*—
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Young, Serenus H. A. Process and apparatus for converting coal into oil and other coal derivatives. 4,108,759, Cl. 208-10.000.

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Zahid, Abduz, to Greer Hydraulics, Inc. Silent-acting hydraulic accumulator device. 4,108,209, Cl. 138-30.000.

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Zahnraderfabrik Renk Aktiengesellschaft: *See*—
John, Erich; Oesterle, Albert; and Pollak-Banda, Erich, 4,108,018, Cl. 74-467.000.

Zampiello, Albert N.; and Patch, Bradley J., Jr., to Raytheon Company. Laser gyroscope detector and path length control system. 4,108,553, Cl. 356-106.0LR.

Zanio, Kenneth W.; and Fraas, Lewis M., to Hughes Aircraft Company. Large grain thin film polycrystalline P-InP/n-Cds solar cell. 4,108,684, Cl. 136-89.0TF.

Zenker, Walter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Power take off with clutch and brake. 4,108,291, Cl. 192-4.00R.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF AUGUST, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adams, Dale A. Apparatus for providing energy communication between a moving and a stationary terminal. Re. 29,738, Cl. 350-6.500.

Aidlin, Joseph W.: *See—*
Kessler, Saul, Re. 29,739, Cl. 204-56.00R.

Bottum, Edward W. Solar collector. Re. 29,737, Cl. 126-271.000.

Harada, Susumu: *See—*
Norimatsu, Hideaki; and Harada, Susumu, Re. 29,741, Cl. 364-431.000.

Kessler, Saul, to Aidlin, Joseph W. Process for forming an anodic oxide coating on metals. Re. 29,739, Cl. 204-56.00R.

Miyaoka, Senri: *See—*
Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, Re. 29,740, Cl. 315-368.000.

Morio, Minoru: *See—*
Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, Re. 29,740, Cl. 315-368.000.

Nippondenso Co., Ltd.: *See—*
Norimatsu, Hideaki; and Harada, Susumu, Re. 29,741, Cl. 364-431.000.

Norimatsu, Hideaki; and Harada, Susumu, to Nippondenso Co., Ltd. Air-fuel ratio feed back type fuel injection control system. Re. 29,741, Cl. 364-431.000.

Ohgoshi, Akio: *See—*
Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, Re. 29,740, Cl. 315-368.000.

Phillips, Harry: *See—*
Shea, John J.; and Phillips, Harry, Re. 29,736, Cl. 32-26.000.

Shea, John J.; and Phillips, Harry, to Xomed Inc. High speed bone drill. Re. 29,736, Cl. 32-26.000.

Sony Corporation: *See—*
Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, Re. 29,740, Cl. 315-368.000.

Xomed Inc.: *See—*
Shea, John J.; and Phillips, Harry, Re. 29,736, Cl. 32-26.000.

Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Morio, Minoru, to Sony Corporation. Color cathode ray tube of the plural beam, single electron gun type. Re. 29,740, Cl. 315-368.000.

LIST OF DESIGN PATENTEES

AB Bofors: *See—*
Dahlberg, Sten Johan, 249,088, Cl. D15-32.000.

Abbott Laboratories: *See—*
D'Alo, Herbert F., 249,065, Cl. D24-53.000.
D'Alo, Herbert F.; Pawlak, Kenneth E.; and Knox, Kenneth H., 249,067, Cl. D24-53.000.
Pawlak, Kenneth E., 249,066, Cl. D24-53.000.

Ackerman, Marvin. Inclined viewing digital wristwatch case. 249,024, 8-22-78, Cl. D10-30.000.

Alexander, Thomas A. Table. 249,003, 8-22-78, Cl. D6-177.000.

American Optical Corporation: *See—*
Revoir, William H., 249,072, Cl. D29-8.000.

American Security Equipment Company: *See—*
Lepow, Mark Norman, 249,026, Cl. D10-106.000.

Ames, John B. Dispensing top for granulated material. 249,023, 8-22-78, Cl. D9-257.000.

Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., to Olinkraft, Inc. Blank for a disposable tray. 249,022, 8-22-78, Cl. D9-245.000.

Benson, James A.: *See—*
Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., 249,064, Cl. D24-17.000.

Black, Albert David. Fishing rod supporting device. 249,049, 8-22-78, Cl. D22-13.000.

Bossons, William Raymond, to W. H. Bossons (Sales) Ltd. Statuette. 249,028, 8-22-78, Cl. D11-158.000.

Bossons, William Raymond, to W. H. Bossons (Sales) Ltd. Statuette. 249,029, 8-22-78, Cl. D11-158.000.

Bossons, William Raymond, to W. H. Bossons (Sales) Ltd. Statuette. 249,030, 8-22-78, Cl. D11-158.000.

Bowman, William K., Jr. Portable instructional flight aid device. 249,046, 8-22-78, Cl. D19-63.000.

Brunas, Renato. Hairbrush. 248,996, 8-22-78, Cl. D4-35.000.

Burtis, Eric F. Console for apparatus for performing mathematical functions. 249,091, 8-22-78, Cl. D64-11.00B.

Carman, Edward W. Golf sand-trap smoothing implement. 249,013, 8-22-78, Cl. D8-13.000.

Comensoli, Leo, to Speedo Knitting Mills Pty Ltd. Textile fabric. 249,095, 8-22-78, Cl. D92-1.0FF.

Construction Specialties, Inc.: *See—*
Polifka, Michael, 249,069, Cl. D25-87.000.

Costello, Michael. Sash lock. 249,017, 8-22-78, Cl. D8-337.000.

Costello, Michael. Guard plate for a sash lock. 249,018, 8-22-78, Cl. D8-343.000.

Crafoord, Carl-Goran; and Grieves, John, to Norabel AB. Dental instrument. 249,062, 8-22-78, Cl. D24-10.000.

Crouse, Richard G. Stand for potted plants. 249,004, 8-22-78, Cl. D6-145.000.

Culbertson, Richard, to General Electric Company. CB microphone or similar article. 249,041, 8-22-78, Cl. D14-12.000.

Currie, Grover C. Gutter cleaner. 249,010, 8-22-78, Cl. D7-161.000.

Cyborg Corporation: *See—*
James, J. Michael, 249,063, Cl. D24-17.000.

Dahlberg, Sten Johan, to AB Bofors. Front lips for digging bucket or the like. 249,088, 8-22-78, Cl. D15-32.000.

D'Alo, Herbert F., to Abbott Laboratories. Urinary drainline sampling port adapter. 249,065, 8-22-78, Cl. D24-53.000.

D'Alo, Herbert F.; Pawlak, Kenneth E.; and Knox, Kenneth H., to Abbott Laboratories. Urinary drainline sampling port adapter. 249,067, 8-22-78, Cl. D24-53.000.

Damascus, James L., to Gabriel Industries, Inc. Toy pot. 249,085, 8-22-78, Cl. D34-15.00R.

Davis, Ben H., Jr.: *See—*
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Dawes, Kevin J.: *See—*
Evans, Michael G., 249,070, Cl. D27-03.000.

Day, Ronald: *See—*
Matthews, Bruce Ernest; and Day, Ronald, 249,015, Cl. D8-60.000.

Dezura, Waldo. Shower curtain holder. 249,005, 8-22-78, Cl. D6-208.100.

Dezura, Waldo. Shower curtain holder. 249,006, 8-22-78, Cl. D6-208.100.

Dibble, Joseph. Ornament. 249,027, 8-22-78, Cl. D11-125.000.

Dowco Corporation: *See—*
Dowdell, Joshua R., Jr.; and Sanderson, Paul H., 249,061, Cl. D23-112.000.

Dowdell, Joshua R., Jr.; and Sanderson, Paul H., to Dowco Corporation. Drainable blade louver head. 249,061, 8-22-78, Cl. D23-112.000.

Drell, Ronald; and Epstein, Max I., to Vertiflex Company, The. Filing tray. 249,048, 8-22-78, Cl. D19-92.000.

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Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 249,022, Cl. D9-245.000.

Epstein, Max I.: *See—*
Drell, Ronald; and Epstein, Max I., 249,048, Cl. D19-92.000.

Evans, Michael G., to Dawes, Kevin J. Smoking device. 249,070, 8-22-78, Cl. D27-03.000.

Evans, Roger C. Ball holder. 249,083, 8-22-78, Cl. D34-5.0CB.

Everts, Robert G. Weed cutter. 249,012, 8-22-78, Cl. D8-8.000.

Floyd, Roger M.: *See—*
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 249,022, Cl. D9-245.000.

Fratelli Saporiti: *See—*
Offredi, Giovanni, 249,001, Cl. D6-157.000.
Offredi, Giovanni, 249,002, Cl. D6-164.000.

Fredriksson, Lars, to K A Bergs Smide AB. Combined hook and anchorage casing. 249,019, 8-22-78, Cl. D8-367.000.

Friesen, Elmer; and Friesen, Ronald. Storage bin. 249,050, 8-22-78, Cl. D23-2.000.

Friesen, Ronald: *See—*
Friesen, Elmer; and Friesen, Ronald, 249,050, Cl. D23-2.000.

Friskel, Joseph W. Golf shot director. 249,077, 8-22-78, Cl. D34-5.0CB.

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Globe Industrial Sales Company: *See*—
Soderman, Walter W.; and Harman, Clifford H., II, 249,079, Cl. D34-5.0BC.
Goldstein, Arthur. After bath dryer. 249,058, 8-22-78, Cl. D23-74.000.
Greif, Francis. Combined telephone stand and index. 249,047, 8-22-78, Cl. D19-76.000.
Grieves, John: *See*—
Crafoord, Carl-Goran; and Grieves, John, 249,062, Cl. D24-10.000.
Groeneveld, Johannes. Implement for finishing joints between tiles. 249,014, 8-22-78, Cl. D8-45.000.
Groth, Daniel F. Aquarium cover. 249,074, 8-22-78, Cl. D30-12.000.
Grove, Lawrence L.; and Snyder, Paul V., to General Electric Company. Broiler pan or similar article. 249,009, 8-22-78, Cl. D7-91.000.
Gutke, William D. Game target. 249,078, 8-22-78, Cl. D34-5.0PP.
Hansrote, Robert R. Water distiller unit. 249,051, 8-22-78, Cl. D23-3.000.
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Hansrote, Robert R. Water distiller unit. 249,056, 8-22-78, Cl. D23-3.000.
Hansrote, Robert R. Water distiller unit. 249,057, 8-22-78, Cl. D23-3.000.
Harden, James L. Aquarium cover. 249,073, 8-22-78, Cl. D30-12.000.
Harman, Clifford H., II: *See*—
Soderman, Walter W.; and Harman, Clifford H., II, 249,079, Cl. D34-5.0BC.
Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, to Sharp Kabushiki Kaisha. Electronic calculating machine. 249,093, 8-22-78, Cl. D64-11.00B.
Hermansen, Don L.; and Davis, Ben H., Jr. Center loaded citizens band antenna. 249,040, 8-22-78, Cl. D14-86.000.
Hewlett-Packard Company: *See*—
LaCelle, Leroy J., 249,090, Cl. D64-11.00B.
Hill, Douglas J.: *See*—
Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., 249,064, Cl. D24-17.000.
Hinklin, Darrell W., to Toro Company, The. Lawn and garden tractor. 249,042, 8-22-78, Cl. D15-23.000.
Houlihan, John T., to General Electric Company. Portable radio. 249,039, 8-22-78, Cl. D14-70.000.
House, Bennie L. Paper roll holder. 248,999, 8-22-78, Cl. D6-97.000.
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Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, 249,093, Cl. D64-11.00B.
James, J. Michael, to Cyborg Corporation. Biofeedback training module. 249,063, 8-22-78, Cl. D24-17.000.
Jones, Paul W.: *See*—
Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., 249,064, Cl. D24-17.000.
Jones, Rodger L.; and Scott, Hoyt A. Fireplace grate. 249,011, 8-22-78, Cl. D7-207.000.
K A Bergs Smide AB: *See*—
Fredriksson, Lars, 249,019, Cl. D8-367.000.
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D'Alo, Herbert F.; Pawlak, Kenneth E.; and Knox, Kenneth H., 249,067, Cl. D24-53.000.
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Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, 249,093, Cl. D64-11.00B.
Kowalski, Robert R. Poker aid card. 249,084, 8-22-78, Cl. D34-13.00A.
Kullenback, Jan G. L. S. Combined toilet paper holder and shelf for lavatories. 248,998, 8-22-78, Cl. D6-91.000.
L C Chemical Company, Limited: *See*—
Nakamura, Kenji, 249,025, Cl. D10-125.000.
LaCelle, Leroy J., to Hewlett-Packard Company. Casing for an electronic calculator. 249,090, 8-22-78, Cl. D64-11.00B.
Lepow, Mark Norman, to American Security Equipment Company. Money clip alarm unit for cash registers and the like. 249,026, 8-22-78, Cl. D10-106.000.
Levitt, Herbert, to Warnaco Inc. Hanger. 249,008, 8-22-78, Cl. D6-254.000.
Lords III Research & Development Co.: *See*—
Tarran, Phil Keith, 249,031, Cl. D12-25.000.
Tarran, Phil Keith, 249,032, Cl. D12-25.000.
Martin, Wayne L. Flexible automobile ski rack. 249,035, 8-22-78, Cl. D12-157.000.
Matthews, Bruce Ernest; and Day, Ronald, to Stanley Works Pty. Ltd., The. Pipe cutter. 249,015, 8-22-78, Cl. D8-60.000.
McCreary, Richard D. Golf putter head. 249,082, 8-22-78, Cl. D34-5.0GH.
McMullen, Thomas J. Spray cleaning unit. 249,043, 8-22-78, Cl. D15-34.000.
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Metz Mannheim GmbH: *See*—
Metz, Walter, 249,037, Cl. D13-32.000.
Metz, Walter, to Metz Mannheim GmbH. Compression switch. 249,037, 8-22-78, Cl. D13-32.000.
Miller, John H. Recycling apparatus. 249,045, 8-22-78, Cl. D15-123.000.
Moncrieff-Yeates, Alexander J. Fireplace unit. 249,059, 8-22-78, Cl. D23-94.000.
Nakamura, Kenji, to L C Chemical Company, Limited. Dial for clock. 249,025, 8-22-78, Cl. D10-125.000.
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Crafoord, Carl-Goran; and Grieves, John, 249,062, Cl. D24-10.000.
Offredi, Giovanni, to Fratelli Saporiti. Storage shelf unit. 249,001, 8-22-78, Cl. D6-157.000.
Offredi, Giovanni, to Fratelli Saporiti. Cabinet. 249,002, 8-22-78, Cl. D6-164.000.
Ohie, Yoshihisa, to Sharp Kabushiki Kaisha. Electronic calculating machine. 249,092, 8-22-78, Cl. D64-11.00B.
Olinkraft, Inc.: *See*—
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 249,022, Cl. D9-245.000.
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Pawlak, Kenneth E.: *See*—
D'Alo, Herbert F.; Pawlak, Kenneth E.; and Knox, Kenneth H., 249,067, Cl. D24-53.000.
Peed, Jim. Sofa or the like. 248,997, 8-22-78, Cl. D6-63.000.
Pettengill, Floyd E., to General Foods Corporation. Jar. 249,021, 8-22-78, Cl. D9-85.000.
Physio-Control Corporation: *See*—
Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., 249,064, Cl. D24-17.000.
Platt, Edward. Bird feeder. 249,075, 8-22-78, Cl. D30-14.000.
Polifka, Michael, to Construction Specialties, Inc. Decorative screen for facades. 249,069, 8-22-78, Cl. D25-87.000.
Popeil Brothers, Inc.: *See*—
Popeil, Samuel J., 249,044, Cl. D15-97.000.
Popeil, Samuel J., to Popeil Brothers, Inc. Food slicer with indexing turret. 249,044, 8-22-78, Cl. D15-97.000.
Potter, Francis Norman. Boat hull. 249,033, 8-22-78, Cl. D12-62.000.
Prisland, Theodore: *See*—
Knobel, Gladys; and Prisland, Theodore, 249,007, Cl. D6-247.000.
Ramalia, Michael W.; and Meisling, William H. Knapsack for a motorcycle sissy bar. 249,036, 8-22-78, Cl. D12-158.000.
Raniero, John. Cargo hold down binder. 249,020, 8-22-78, Cl. D8-382.000.
Ratnik, H. Ronald. Hydrant handle. 249,060, 8-22-78, Cl. D23-28.000.
Revoir, William H., to American Optical Corporation. Disposable respiratory mask. 249,072, 8-22-78, Cl. D29-8.000.
Richard Heinze GmbH & Co. KG, Firma: *See*—
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Jones, Rodger L.; and Scott, Hoyt A., 249,011, Cl. D7-207.000.
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Hazama, Shigetoshi; Ikeda, Matafumi; Yamagami, Masafumi; and Kobayashi, Yoshiaki, 249,093, Cl. D64-11.00B.
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Shepard, George E., Jr. Water pipe. 249,071, 8-22-78, Cl. D27-03.000.
Simmons, Earle G. Display stand for jewelry chain. 249,000, 8-22-78, Cl. D6-139.000.
Simmons, Earle G. Bird feeder. 249,087, 8-22-78, Cl. D30-15.000.
Smith, David B.; Hill, Douglas J.; Benson, James A.; and Jones, Paul W., to Physio-Control Corporation. Portable defibrillator/EKG monitor/EKG recorder. 249,064, 8-22-78, Cl. D24-17.000.
Snyder, Paul V.: *See*—
Grove, Lawrence L.; and Snyder, Paul V., 249,009, Cl. D7-91.000.
Snyder, Stanley Gene. Van top. 249,034, 8-22-78, Cl. D12-156.000.
Soderman, Walter W.; and Harman, Clifford H., II, to Globe Industrial Sales Company. Game stick for throwing or catching a ring. 249,079, 8-22-78, Cl. D34-5.0BC.
Speedo Knitting Mills Pty Ltd: *See*—
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Spellier, Roland, to Richard Heinze GmbH & Co. KG, Firma. Handle for furniture doors, drawers or the like. 249,016, 8-22-78, Cl. D8-306.000.
Stanley Works Pty. Ltd., The: *See*—
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Stewart, Arthur H., Jr. Tent. 249,094, 8-22-78, Cl. D88-3.00B.
Studley, Donald E., to Tennis Designs by Studley, Inc. Tennis ball printer. 249,089, 8-22-78, Cl. D64-10.000.
Tancredi, John. Toy dog and sled. 249,086, 8-22-78, Cl. D34-15.0AN.

Tarran, Phil Keith, to Lords III Research & Development Co. Combined hand truck and ladder. 249,031, 8-22-78, Cl. D12-25.000.
Tarran, Phil Keith, to Lords III Research & Development Co. Combined hand truck and ladder. 249,032, 8-22-78, Cl. D12-25.000.
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Studley, Donald E., 249,089, Cl. D64-10.000.
Toro Company, The: *See*—
Hinklin, Darrell W., 249,042, Cl. D15-23.000.
Vertiflex Company, The: *See*—
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Bossons, William Raymond, 249,028, Cl. D11-158.000.
Bossons, William Raymond, 249,029, Cl. D11-158.000.
Bossons, William Raymond, 249,030, Cl. D11-158.000.
Wallace, Milton A. Interlocking wall unit. 249,068, 8-22-78, Cl. D25-58.000.
Walz, David K. Dictating machine. 249,038, 8-22-78, Cl. D14-3.000.
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Levitt, Herbert, 249,008, Cl. D6-254.000.
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Zick, Ronald W., to Game Time, Inc. Playground rider. 249,081, 8-22-78, Cl. D34-5.00C.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 22, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

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169.12 4,107,888
259 4,107,889
379 4,107,890
394 4,107,891
403 4,107,892
537 4,107,896
593 4,107,894
687 4,107,895
716 4,107,898
747 4,107,899
775 4,107,893
823 4,107,897

CLASS 53

3 4,107,905
138 A 4,107,903
142 4,107,904
180 R 4,107,900

CLASS 55

2 4,108,615
48 4,108,616
162 4,108,617
178 4,108,618
192 4,108,619
210 4,108,620

CLASS 56

17.5 4,107,901
27.5 4,107,902
246 4,107,906
320.2 4,107,907

CLASS 57

1 R 4,107,908
5 4,107,909
34 R 4,107,910
4,107,957
56 4,107,911
68 4,107,912
125 4,107,913
164 4,107,914

CLASS 58

23 R 4,107,915
38 R 4,107,916

CLASS 59

85 4,107,917

CLASS 60

39.71 4,107,918
276 4,107,920
288 4,107,921
298 4,107,922
427 4,107,923
445 4,107,924
521 4,107,925
548 4,107,926
605 4,107,927
650 4,107,928

CLASS 61

14 4,107,929
41 R 4,107,930
45 D 4,107,931
48 4,107,932
107 4,107,933

CLASS 62

3 4,107,934
4,107,935
5 4,107,936
64 4,107,937
71 4,107,938
89 4,107,939
121 4,107,940
186 4,107,941
305 4,107,942
320 4,107,943
401 4,107,944
499 4,107,945
514 R 4,107,946

CLASS 63

2 4,107,947

CLASS 64

2 P 4,107,948
9 A 4,107,949
13 4,107,950
14 4,107,951
32 F 4,107,952

CLASS 65

30 R 4,108,621
4,108,622
163 4,108,623
273 4,108,624

CLASS 66

1 R 4,107,953
133 4,107,954
176 4,107,955
195 4,107,956

CLASS 70

52 4,107,965
58 4,107,958
159 4,107,959
165 4,107,961
243 4,107,962
337 4,107,963
364 A 4,107,966
427 4,107,967
436 4,107,968

CLASS 71

9 4,108,625
76 4,108,626
91 4,108,627
92 4,108,628
94 4,108,629
4,108,630
103 4,108,631
115 4,108,632

CLASS 72

36 4,107,964
148 4,107,969
165 4,107,970
237 4,107,971
334 4,107,972
450 4,107,973
457 4,107,974

CLASS 73

11 4,107,975
45.3 4,107,977
52 4,107,976
83 4,107,978
88 E 4,107,981
88 R 4,107,979
4,107,980
95 4,107,982
100 4,107,983
113 4,107,984
141 A 4,107,985
147 4,107,986
151 4,107,987
178 R 4,107,988
189 4,107,989
194 B 4,107,990
204 4,107,991
260 4,107,992
290 R 4,107,993
290 V 4,107,994
300 4,107,995
4,107,996
304 R 4,107,997
313 4,107,998
326 4,107,999
328 4,108,000
339 R 4,108,001
371 4,108,002
425.4 R 4,108,003
432 R 4,108,004
514 4,108,005
517 R 4,108,006
732 4,108,007
756 4,108,008

CLASS 74

61 4,108,009
100 R 4,108,010
229 4,108,011
231 C 4,108,012
242.11 C 4,108,013
243 H 4,108,014
421 A 4,108,015
462 4,108,016
4,108,017
467 4,108,018
469 4,108,019
558 4,108,020
606 R 4,108,021
645 4,108,022
804 4,108,023
813 L 4,108,024

CLASS 75

11 4,108,633
23 4,108,634
24 4,108,635
35 4,108,636
53 4,108,637
63 4,108,638
101 R 4,108,639
103 4,108,640
124 4,108,641
134 F 4,108,642
135 4,108,643
4,108,644
4,108,645
148 4,108,646
171 4,108,647
4,108,648
203 4,108,649
206 4,108,650
208 CS 4,108,651
223 4,108,652

CLASS 81

3 R 4,108,025
4,108,026
9.5 B 4,108,028
60 4,108,027

CLASS 83

54 4,108,029
77 4,108,030
90 4,108,031
106 4,108,032
122 4,108,033
361 4,108,034

CLASS 84

1.01 4,108,035
4,108,036
1.03 4,108,037
4,108,038
1.19 4,108,039
4,108,040
1.24 4,108,041
471 R 4,108,042

CLASS 85

70 4,108,043

CLASS 86

19 4,108,044

CLASS 89

36 K 4,108,045
43 A 4,108,046

CLASS 90

1.6 R 4,108,047

CLASS 91

6.5 4,108,048
478 4,108,049

CLASS 92

48 4,108,050

CLASS 96

1 SD 4,108,653
1.2 4,108,654
1.5 R 4,108,655
4,108,656
1.6 4,108,657
15 D 4,108,658
36.3 4,108,659
38.2 4,108,660
59 4,108,661
66.5 4,108,662
74 4,108,663
75 4,108,664
76 R 4,108,803
114.1 4,108,665
115 P 4,108,666
131 4,108,667
135 4,108,668

CLASS 99

275 4,108,052
306 4,108,053
348 4,108,054
421 H 4,108,055
452 4,108,056
4,108,057
466 4,108,058
543 4,108,059
591 4,108,060

CLASS 100

7 4,108,061
11 4,108,062
53 4,108,063
187 4,108,064
215 4,108,065

CLASS 101

22 4,108,066
224 4,108,067
363 4,108,068
415.1 4,108,069

CLASS 102

8 4,108,070
24 HC 4,108,071
52 4,108,072
4,108,073
92.7 4,108,074
214 4,108,075

CLASS 104

2 4,108,076
156 4,108,077
172 S 4,108,078
252 4,108,079

CLASS 105

199 CB 4,108,080
366 B 4,108,081
464 4,108,082

CLASS 106

13 4,108,669
22 4,108,671
38.9 4,108,672
40 R 4,108,670
47 Q 4,108,673
53 4,108,674
56 4,108,675
65 4,108,676
109 4,108,677
243 4,108,678
307 4,108,679

CLASS 108

6 4,108,083
29 4,108,084
108 4,108,085
157 4,108,086

CLASS 109

51 4,108,087

CLASS 110

246 4,108,088

CLASS 111

7 4,108,089

CLASS 112

121.11 4,108,090
134 4,108,094
158 E 4,108,091
4,108,093
158 R 4,108,092
184 4,108,095
221 4,108,096
287 4,108,097
289 4,108,098

CLASS 113

120 A 4,108,099

CLASS 114

102 4,108,100
245 4,108,101
264 4,108,102

CLASS 116

116 4,108,103
148 4,108,104

CLASS 118

2 4,108,105
49 4,108,106
49.1 4,108,107
4,108,108
52 4,108,109
412 4,108,110
655 4,108,111
4,108,112

CLASS 123

3 4,108,113
4,108,114
32 A 4,108,116
32 EB 4,108,115
33 A 4,108,117
41.57 4,108,118
75 C 4,108,119

103 B 4,108,120
119 EC 4,108,121
4,108,122
4,108,123
122 AC 4,108,124
122 E 4,108,126
122 F 4,108,125
124 R 4,108,127
139 AQ 4,108,130
139 AW 4,108,128
139 AZ 4,108,129
148 CC 4,108,131
188 S 4,108,132
191 S 4,108,133
196 R 4,108,134
4,108,135
209 4,108,136
242 4,108,137

CLASS 126

19 R 4,108,138
21 A 4,108,139
24 4,108,140
41 R 4,108,141
4,108,142
110 B 4,108,143
120 4,108,144
140 4,108,145
270 4,108,154
4,108,155
271 Re.29,737
4,108,156
4,108,157
4,108,158
4,108,159
4,108,160

CLASS 128

1 R 4,108,161
2 B 4,108,162
2 H 4,108,163
2 V 4,108,165
2.06 F 4,108,166
25 4,108,164
66 4,108,167
80 A 4,108,168
89 R 4,108,169
134 4,108,170
142.2 4,108,171
188 4,108,172
214 R 4,108,173
4,108,174
214.4 4,108,175
218 A 4,108,176
4,108,177
224 4,108,178
284 4,108,179
285 4,108,180
303.1 4,108,181
305 4,108,182
400 4,108,146
404 4,108,147
419 PG 4,108,148
579 R 4,108,149

CLASS 130

27 H 4,108,150

CLASS 131

9 4,108,151
173 4,108,152
235 R 4,108,153

CLASS 132

42 A 4,108,183
46 R 4,108,184
124 4,108,186

CLASS 133

3 A 4,108,187

CLASS 134

3 4,108,680
20 4,108,681
25 R 4,108,682
27 4,108,683
57 R 4,108,188
138 4,108,189
167 R 4,108,190

CLASS 135

2 4,108,191

CLASS 136

89 TF 4,108,684

CLASS 137

1 4,108,192
13 4,108,193
15 4,108,194
68 A 4,108,195
72 4,108,196
81 4,108,197
194 4,108,198
312 4,108,199
344 4,108,200
393 4,108,201
436 4,108,202
496 4,108,203
543.13 4,108,204
554 4,108,205
596.17 4,108,206
625.47 4,108,207
636.3 4,108,208

CLASS 138

30 4,108,209
42 4,108,210
120 4,108,211
122 4,108,212

CLASS 139

54 4,108,213
97 4,108,214
438 4,108,215
452 4,108,216

CLASS 140

105 4,108,217

CLASS 141

1 4,108,218
3 4,108,219
98 4,108,220
146 4,108,221
337 4,108,222
392 4,108,223

CLASS 144

34 E 4,108,224
134 D 4,108,225
327 4,108,226

CLASS 148

1.5 4,108,685
4,108,686
2 4,108,687
3 4,108,688
6.15 R 4,108,689
4,108,690
11.5 A 4,108,691
12.3 4,108,692
16.5 4,108,693
31.55 4,108,694
39 4,108,695

CLASS 149

19.2 4,108,696
19.3 4,108,697

CLASS 150

15 4,108,227

CLASS 152

7 4,108,228
175 4,108,229
210 4,108,230
290 4,108,231
365 4,108,232

CLASS 156

60 4,108,698
92 4,108,699
153 4,108,700
160 4,108,701
192 4,108,702
244.13 4,108,703
272 4,108,704
355 4,108,705
384 4,108,706
397 4,108,707
441 4,108,708
446 4,108,709
450 4,108,710
497 4,108,711
498 4,108,712
499 4,108,713
608 4,108,714
628 4,108,715
636 4,108,716
656 4,108,717

CLASS 157

1.37 4,108,233

CLASS 159

30 4,108,718

CLASS 164

38 4,108,234
252 4,108,235
338 R 4,108,236
425 4,108,237

CLASS 165

57 4,108,238
105 4,108,239
125 4,108,240
146 4,108,241
164 4,108,242
169 4,107,919

CLASS 166

66 4,108,243
268 4,108,244
301 4,108,245
312 4,108,246

CLASS 169

38 4,108,247

CLASS 172

9 4,108,248
328 4,108,249
719 4,108,250
789 4,108,251

CLASS 173

12 4,108,252
23 4,108,253
43 4,108,254

CLASS 174

67 4,109,095
68.5 4,109,096
86 4,109,097
106 SC 4,109,098
107 4,109,099

CLASS 175

9 4,108,255
61 4,108,256
230 4,108,257
320 4,108,258
344 4,108,259
374 4,108,260

CLASS 176

19 R 4,108,719
20 R 4,108,720
36 R 4,108,721

CLASS 177

120 4,108,261
136 4,108,262
145 4,108,263

CLASS 178

67 4,109,100
4,109,101
69.1 4,109,102

CLASS 179

1 D 4,109,107
1 N 4,109,106
1 P 4,109,108
1 SD 4,109,104
1 SG 4,109,103
1 VE 4,109,105
15 AP 4,109,110
15 BY 4,109,109
18 BC 4,109,111
81 R 4,109,112
99 4,109,113
100.11 4,109,115
100.4 D 4,109,114
107 E 4,109,116
175.3 F 4,109,117

CLASS 180

2 R 4,108,264
66 R 4,108,265
68.5 4,108,266
71 4,108,267
74 4,108,268
98 4,108,269
148 4,108,273

CLASS 181

114 4,108,270
119 4,108,271
120 4,108,272
229 4,108,274
252 4,108,275
256 4,108,276

CLASS 182

82 4,108,277

CLASS 184

7 D 4,108,278
15 R 4,108,279

CLASS 187

20 4,108,280
29 R 4,108,281
4,108,282
52 LC 4,108,283

CLASS 188

59 4,108,284
72.6 4,108,285
218 XL 4,108,286
315 4,108,287

CLASS 191

49 4,108,288

CLASS 192

3.3 4,108,289
4,108,290
4 R 4,108,291
11 4,108,292
67 R 4,108,293
85 R 4,108,294
111 A 4,108,295

CLASS 194

99 4,108,296

CLASS 195

1 4,108,722
2 4,108,723
96 4,108,724
4,108,725
103.5 R 4,108,726
4,108,727
127 4,108,728
4,108,729

CLASS 198

479 4,108,300
633 4,108,301
689 4,108,302
781 4,108,303
4,108,304
834 4,108,298

CLASS 200

5 E 4,109,118
38 BA 4,109,119
51 R 4,109,120
67 E 4,109,121
144 B 4,109,122
4,109,123
148 B 4,109,124
268 4,109,125
302 4,109,126

CLASS 201

2.5 4,108,730
8 4,108,731
22 4,108,732

CLASS 202

267 A 4,108,733

CLASS 203

7 4,108,734
4,108,735

CLASS 204

1.5 4,108,736
11 4,108,740
13 4,108,737
15 4,108,738
40 4,108,739
56 R Re.29,739
64 R 4,108,743
67 4,108,741
98 4,108,742
119 4,108,744
129 4,108,745
158 R 4,108,746
159.12 4,108,748
159.17 4,108,749
159.18 4,108,747
181 R 4,108,750
192 N 4,108,751
256 4,108,752
263 4,108,753
4,108,754
4,108,755
286 4,108,756
294 4,108,757

CLASS 206

330 4,108,305
339 4,108,306
387 4,108,307
455 4,108,308
528 4,108,309
570 4,108,310
573 4,108,311

CLASS 208

8 4,108,758
10 4,108,759
11 LE 4,108,760
254 H 4,108,761

CLASS 209

111.7 T 4,108,762

CLASS 210

14 4,108,763
22 A 4,108,764
23 R 4,108,765
32 4,108,766
42 S 4,108,767
43 4,108,768
50 4,108,769
4,108,770
4,108,771
64 4,108,772
122 4,108,773
167 4,108,774
169 4,108,775
224 4,108,776
225 4,108,777
297 4,108,778

CLASS 211

13 4,108,312
64 4,108,313
74 4,108,314
124 4,108,315
199 4,108,316

CLASS 214

1 PA 4,108,317
1 R 4,108,318
6 BA 4,108,319
8 4,108,320
8.5 A 4,108,321
16.1 A 4,108,322
310 4,108,323

CLASS 215

1 C 4,108,324
364 4,108,325

CLASS 219

7.5 4,109,127
10.43 4,109,128
10.55 B 4,109,129
130.21 4,109,130
137.62 4,109,131
147 4,109,132
203 4,109,133
216 4,109,134
4,109,135
252 4,109,136
285 4,109,137
364 4,109,138

CLASS 220

1.5 4,108,326
3 4,108,327
5 A 4,108,328
260 4,108,330
269 4,108,331
370 4,108,332
453 4,108,329

CLASS 221

13 4,108,333

CLASS 222

136 4,108,334
137 4,108,335
148 4,108,336
194 4,108,337
286 4,108,338
591 4,108,339

CLASS 224

4 E 4,108,340
5 H 4,108,341
42.01 4,108,342

CLASS 225

1 4,108,343

CLASS 226

4,108,344

CLASS 227

131 4,108,345

CLASS 228

49 4,108,346

CLASS 229

1.5 B 4,108,347
15 4,108,348
4,108,349
37 R 4,108,350
62 4,108,351
69 4,108,352

CLASS 233

26 4,108,353
30 4,108,354

CLASS 235

1 C 4,108,355
69 4,108,356
92 CA 4,109,141
92 CN 4,109,139
92 DN 4,109,142
92 MT 4,109,140
119 4,108,357
302 4,108,358
304 4,108,359
4,108,360
375 4,108,361
4,108,362
383 4,108,363
419 4,108,364
4,108,365
450 4,108,366
457 4,108,367
462 4,109,143
463 4,108,368

CLASS 236

1 G 4,108,369
15 A 4,108,370
49 4,108,371
86 4,108,372

CLASS 237

1 A 4,108,373
4,108,374
8 R 4,108,375
12.3 A 4,108,376

CLASS 238

91 4,108,377
298 4,108,378

CLASS 239

119 4,108,379
172 4,108,380
265.35 4,108,381
271 4,108,382
533.5 4,108,383
665 4,108,384

CLASS 240

2 V 4,109,144

CLASS 241

46.04 4,108,385
46.11 4,108,386
82.5 4,108,387

CLASS 242

18 DD 4,108,388
55.3 4,108,389
55.53 4,108,390
58.3 4,108,391
84.21 A 4,108,392
107 4,108,393
107.4 A 4,108,394
107.7 4,108,395
118.11 4,108,396
137.1 4,108,397
199 4,108,398

CLASS 244

3.15 4,108,400
54 4,108,401
139 4,108,402
199 4,108,403

CLASS 246

34 CT 4,108,404
125 4,108,405
474 4,108,406

CLASS 248

23 4,108,407
68 R 4,108,408
96 4,108,409
130 4,108,410
165 4,107,960
4,108,411
181 4,108,412
214 4,108,413
300 4,108,414
370 4,108,415
400 4,108,416

CLASS 249

81 4,108,417

CLASS 250

201 4,109,145
227 4,109,146
231 P 4,109,147
321 4,109,148
347 4,109,149
368 4,109,150
460 4,109,151
486 4,109,152
499 4,109,153
503 4,109,154
505 4,109,155
4,109,156
531 4,109,157
548 4,109,158
564 4,109,159

CLASS 251

5 4,108,418
30 4,108,419
129 4,108,420

CLASS 252

8.5 P 4,108,779
8.55 C 4,108,782
8.6 4,108,780
8.9 4,108,781
54.6 4,108,783
56 R 4,108,784
4,108,785
62.1 P 4,108,786
62.56 4,108,787
63 4,108,788
64 4,108,789
175 4,108,790
182 4,108,791
187 H 4,108,792
299 4,108,793
408 4,108,794
419 4,108,795
429 B 4,108,796

466 PT 4,108,797
502 4,108,798
522 4,108,799
541 4,108,800
544 4,108,801

CLASS 254

88 4,108,421

CLASS 256

67 4,108,422

CLASS 260

22 TN 4,108,811
24 4,108,812
29.2 EP 4,108,815
29.2 TN 4,108,814
29.4 R 4,108,816
29.6 AQ 4,108,818
29.6 E 4,108,817
29.6 NR 4,108,819
29.6 S 4,108,813
30.8 R 4,108,820
4,108,821
32.8 R 4,108,822
33.2 EP 4,108,824
33.4 PQ 4,108,823
37 SB 4,108,825
42.21 4,108,827
45.75 H 4,108,828
45.8 NT 4,108,829
45.85 S 4,108,830
45.95 C 4,108,831
112 G 4,108,847
112.5 R 4,108,846
117 4,108,848
122 4,108,849
162 4,108,850
239.3 B 4,108,852
239.57 4,108,851
252 4,108,854
285.5 4,108,855
290 HL 4,108,856
293.54 4,108,857
294.8 E 4,108,858
296 R 4,108,859
304 A 4,108,860
306.7 C 4,108,861
307 C 4,108,862
314.5 4,108,863
326 C 4,108,864
329 R 4,108,865
4,108,866
332.1 4,108,868
332.2 C 4,108,867
340.7 4,108,869
340.9 R 4,108,870
345.2 4,108,871
4,108,872
4,108,873
346.75 4,108,874
347.2 4,108,876
347.8 4,108,875
4,108,877
395 B 4,108,826
405.6 4,108,879
408 4,108,878
410.5 4,108,880
448 C 4,108,881
448.2 E 4,108,882
453 RW 4,108,883
4,108,884
455 A 4,108,885
455 R 4,108,886
465 F 4,108,888
465 H 4,108,887
502.4 R 4,108,889
507 R 4,108,890
514 D 4,108,892
528 4,108,891
561 N 4,108,893
564 R 4,108,894
566 A 4,108,895
570.5 C 4,108,896
570.8 R 4,108,897
586 C 4,108,898
4,108,899
590 C 4,108,900
4,108,901
4,108,902
4,108,903
600 R 4,108,904
604 HF 4,108,905
609 R 4,108,906
610 B 4,108,907
652.5 R 4,108,910
666 A 4,108,911
667 4,108,912
669 R 4,108,913
671 R 4,108,914
674 SA 4,108,915
676 R 4,108,916
677 R 4,108,917
680 E 4,108,918
4,108,919
683.15 B 4,108,920
827 4,108,921

830 P 4,108,922
836 4,108,923
837 PV 4,108,924
874 4,108,926
875 4,108,942
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277	4,109,006
279	4,109,007
283	4,109,009
289	4,109,010
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315	4,109,013
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550	4,109,024
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255	4,109,032
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280	4,109,073
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74	4,108,843
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	177	249,003
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	247	249,007
	254	249,008
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	207	249,011
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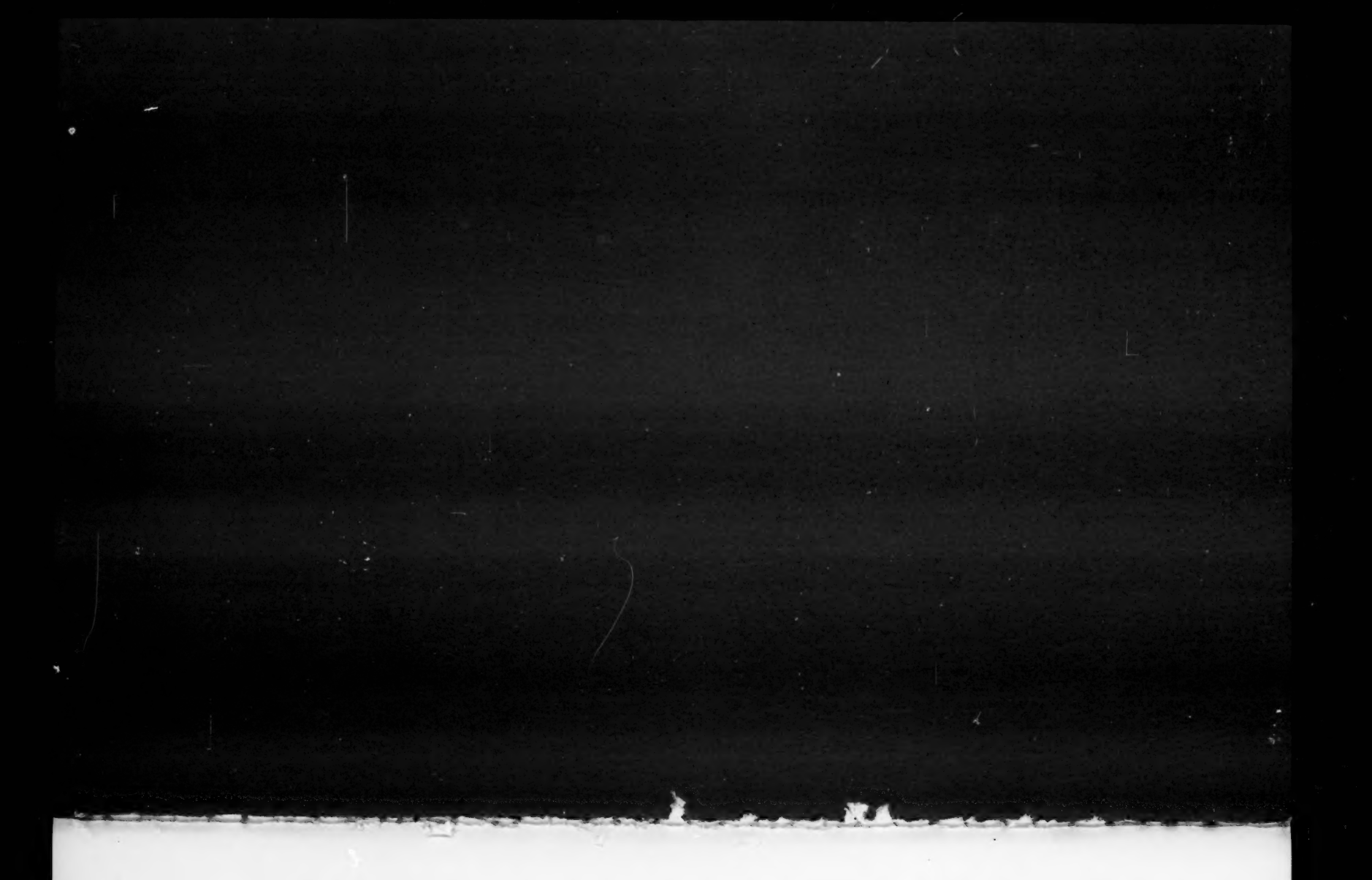

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Donald W. Banner, *Commissioner*